


# Département amélioration des méthodes pour l'innovation scientifique Cirad-amis

## **AGRIFOOD SYSTEMS PROGRAMME**

### Expertise and Activities

BP 5035  
34032 MONTPELLIER Cedex 1  
E-mail: [paa@cirad.fr](mailto:paa@cirad.fr)  
Fax: 04 67 61 44 49  
ASP secretariat : tel. 04 67 61 57 33 / 04 67 61 55 37

Last updated: **Mai 1999**





# **AGRIFOOD SYSTEMS PROGRAMME - ASP**

## **AREAS OF EXPERTISE**

### **CONTENTS**

#### **I. EXPERTISES and ACTIVITIES**

- General presentation
- Programme structure: the different teams (GPE, SMANA, PCBM, SEA)
- Staffing
- Service activities
- Brief presentation of each team (areas of expertise, tools, current projects)
- Presentation of the PROSPER (Prospects and Business-Research Partnership) project
- Presentation of ESIMAQ
- Presentation of the Organic Analysis Service
- ASP staff register

#### **II. SCIENTIFIC PRODUCTS 1998**

- Activity indicators (1998)
- List of scientific publications (1998-1999)
- List of successfully defended theses and accreditations to supervise research (1998)
- List of training courses run by the ASP (1998)
- List of ASP research and development projects (1998)
- List of overseas missions
- Presentation of the Quality Assurance Programme

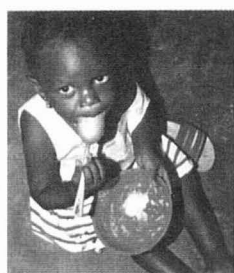




## **I. EXPERTISE AND ACTIVITIES**

- General presentation
- Programme structure: the different teams (GPE, SMANA, PCBM, SEA)
- Staffing
- Service activities
- Brief presentation of each team (areas of expertise, tools, current projects)
- Presentation of the PROSPER (Prospects and Business-Research Partnership) project
- Presentation of ESIMAQ
- Presentation of the Organic Analysis Service
- ASP staff register





# Agrifood Systems

The development of the agrifood sector—agricultural product processing, storage and marketing—is a major challenge for the countries of the south. The sector has to adapt to increasing food demand, rapid urbanization and the internationalization of trade. It is crucial, in the current context of increasing disparity, that this development be organized locally. In conjunction with the national and international scientific community, the Agrifood Systems programme develops and adapts the tools required for applied research and makes them available to the researchers it hosts in its laboratories.

## Objectives

- Increased knowledge of agrifood markets.
- Products that can compete on local and international markets.
- Reduced post-harvest losses.
- Improved processing techniques and equipment.
- Environment-friendly, economical industries.
- More professional agrifood systems.

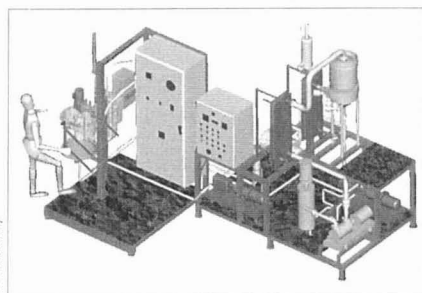


C. Linaud



D. Dufour

Equipment for small-scale or industrial processing.



P. Thauinay

Computer-assisted design of research or development equipment.

## ■ Products

Characterization of the physico-chemical, microbiological, organoleptic and nutritional properties of products.

Improving the competitiveness and quality of traditional products and guaranteeing supplies.

Development of new products.

### Current projects include:

Improving the bread-making qualities of sour cassava starch for domestic consumption and export (Latin America, Africa, Europe).

Development and use of new products derived from oilseeds.

Development of highly nutritious plant-based drinks from starch products and tropical oilseeds.

## ■ Markets

Food consumption trends (surveys, socio-economic diagnoses).

Identification of quality requirements of users: consumers, traders, processing industries.

### Current projects include:

Diversification of the use and promotion of yam, sorghum, millet, maize and fonio-based products in West African towns.

Development of food and nutrition monitoring systems in Africa and Asia.

Inventory of potential markets for tropical roots and tubers in Latin America and Asia.



Centre  
de coopération  
internationale  
en recherche  
agronomique  
pour le  
développement

Department  
of Advanced  
Methods  
for Innovation  
in Science  
CIRAD-AMIS

Agrifood Systems  
Programme

BP 5035  
34032  
Montpellier  
Cedex 1  
France



## ■ Environment

Using co-products, waste by-products and to produce bio-energy (biogas, biofuels) and biopackaging.

Diagnosing the energy requirements of processing technologies.

Optimizing energy consumption.

### Current projects include:

Fuel and lubricant additives derived from fatty acids.

Biomaterials for wrappings, films and trays.

## Main partners

### France

ENSIA (CIRAD-ENSIA associated laboratory).  
INRA, ORSTOM, CEMAGREF, CNRS, universities and schools of higher education.

### Elsewhere in the world

European networks for cold chain and osmotic treatment research.  
Research organizations: CERNA-UNB (Benin), CNRST (Burkina), IRAD (Cameroon), NRCRI (Nigeria), FOFIFA (Madagascar), ITA (Senegal), CIAE (India), PORIM (Malaysia).  
Schools of higher education: ENSAI (Cameroon), ESIMAQ (Morocco), AIT (Thailand).  
Universities of Ibadan (Nigeria), Abidjan and Bouaké (Côte d'Ivoire), São Paulo (Brazil), university del Valle (Colombia).  
International agricultural research centres: CIAT, CIP, IITA.  
NGO: ENDA-GRAF (Senegal).  
Small and large agri-food companies.

## ■ Support for professionals

Participating in strategic planning for agri-food systems research.

Company and sector appraisals.

Training technical and professional operators.

### Current projects include:

In partnership: development of high-level in-house company training in quality management (ESIMAQ, Morocco).

Brazil and southern South America: company appraisals and technology transfers.

## ■ Techniques and equipment

Characterization of traditional processes: practices, equipment, products before and after processing, energy consumption.

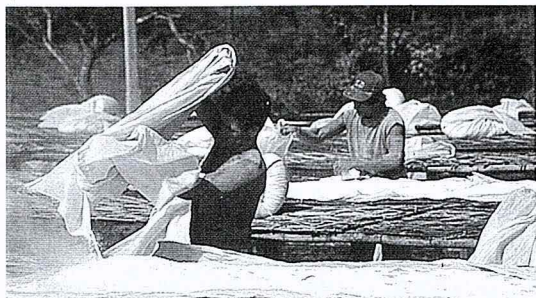
Tools and methods for the management of different operations, on small or industrial scale.

Local equipment design.

### Current projects include:

Improving small-scale and industrial drying, smoking, marinating, salting, sugar preserving, filtration, chilling, freezing and frying techniques and their application to fruit and vegetables, roots and tubers, meat and fish, oilseeds.

Agro-industrial equipment design (oil mills, salting plants, cereal processing).



D. Dufour

Jobs in rural and urban environments.

## The programme at a glance

A staff of 50 in Montpellier, including 45 researchers and technicians. Scientists assigned to Morocco, Thailand, Brazil, Colombia and Réunion.

### Expertise

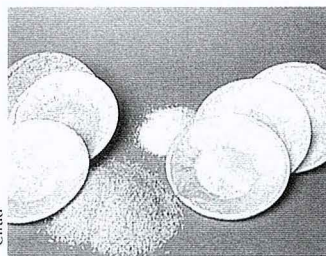
Technology: process engineering, energetics, food science, chemistry, physico-chemistry, oils and fats technology.  
Socio-economics: consumer science, food marketing.

### Installations

Two technology centres (1400 m<sup>2</sup>), 12 analysis laboratories, computer-assisted design laboratory.  
Mechanical construction workshop, energy unit, engine test bed.

### Services

Cooperative project design and implementation, appraisal, training, technical assistance for companies.

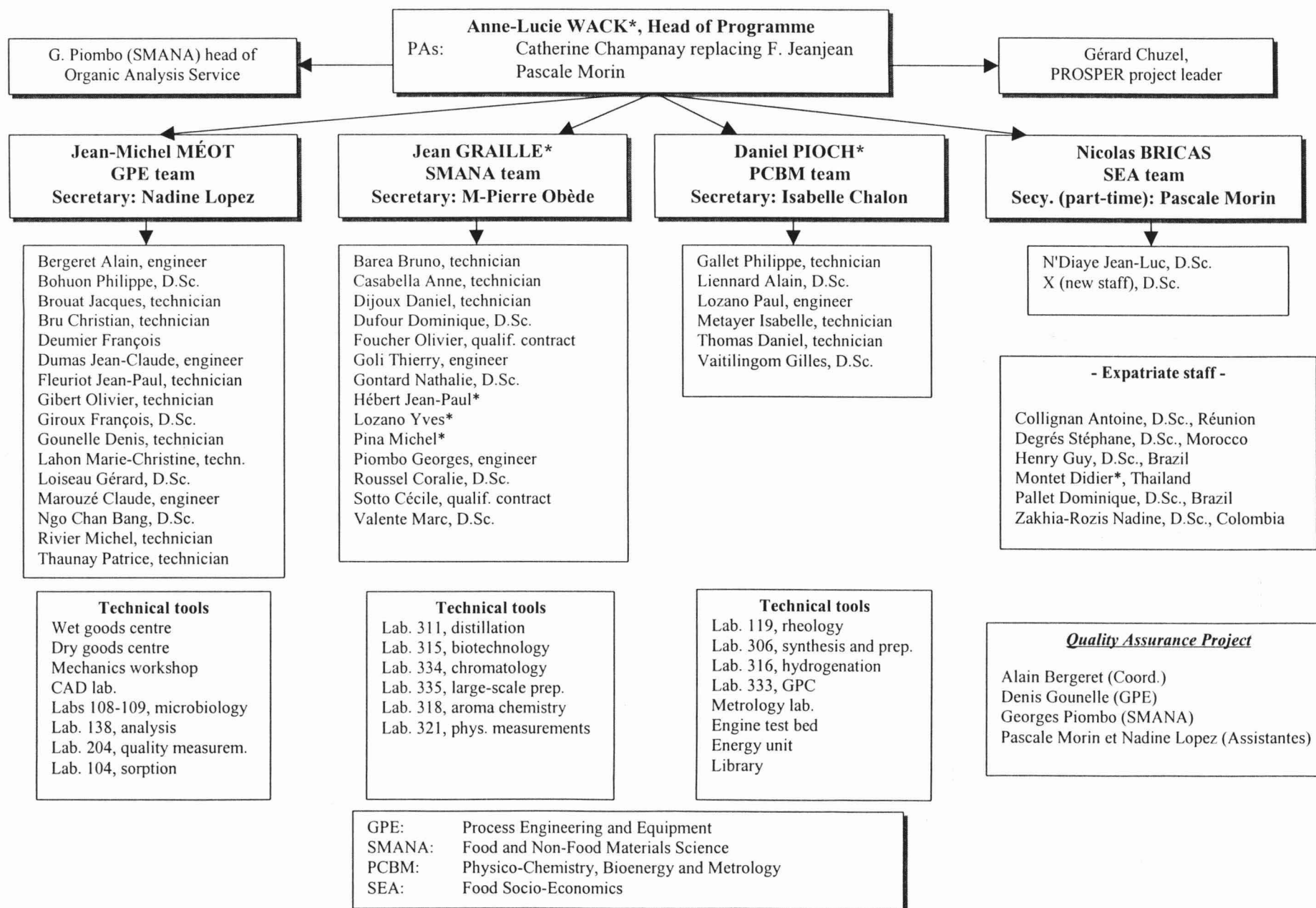


Versatile biomaterials.

### Contact:

Anne-Lucie Wack  
paa@cirad.fr  
telephone:  
33 (0)4 67 61 57 13  
fax:  
33 (0)4 67 61 44 45  
for further  
information:  
www.cirad.fr

# **AGRI FOOD SYSTEMS PROGRAMME**



## STAFFING

◆	GPE - SMANA - PCBM - SEA	48 <sup>1</sup>
◆	Expatriate staff	6
◆	Doctoral students	14
◆	Doctoral students in other CIRAD programmes with contributions from ASP staff	3
◆	Trainees	80 per year

---

<sup>1</sup> Including 5 ENSIA-SIARC teacher-researchers available to the Agrifood Systems Programme.

## SERVICE ACTIVITIES

- ◆ Organic Analysis Service :  
contact: Georges Piombo  
Tel : 04 67 61 58 26
  
- ◆ Design Office Service :  
contact: Claude Marouzé  
Tel : 04 67 61 57 61
  
- ◆ Mechanical Construction Service :  
contact : Denis Gounelle  
Tel: 04 67 61 57 75
  
- ◆ Lab. Equipment Procurement Service :  
contact : Christian Bru  
Tel: 04 67 61 57 22

# **CIRAD-AMIS - AGRIFOOD SYSTEMS PROGRAMME**

## **Process Engineering and Equipment (GPE) Team**

### **GPE**

**Head:** Jean-Michel Méot

**Tel:** 33 (0)4 67 61 57 15

**Fax:** 33 (0)4 67 61 12 23

**E-mail:** jean-michel.méot@cirad.fr

*The tasks of the Process Engineering and Equipment team of the Agrifood Systems Programme are to study the conditions for processing and storing agricultural products and to establish technical solutions enabling them to be put into practice in a given context, using equipment design methods.*

### **Fields of activity**

◆ **All products:** fruit, vegetables, starch products, oilseed products, fish, meat, etc.

#### ◆ **Processes**

- air-drying
- osmotic dehydration, semi-sugar preserving, sugar-preserving, salting, drying, marinading, smoking
- frying
- membrane filtration
- immersion chilling and freezing

#### ◆ **Equipment design**

- CESAM method (design of agricultural and agrifood processing equipment in the countries of the South)
- Development of small-scale and industrial production

### **Human resources**

#### ◆ **Processes**

5 scientists and 3 technicians

#### ◆ **Equipment design**

3 scientists and 5 technicians

### **Technical tools**

#### ◆ **Processes**

1600 m<sup>2</sup> of test workshops, equipped with pilot equipment (crushers, graders, dryers, autoclaves, liquid and solid contactors, concentrators, fryers)

5 laboratories (sorption, physico-chemical and microbiological analysis)

#### ◆ **Equipment design**

- CDCF-Produits software
- 4 CAD workstations equipped with Pro-Engineer and Pro-Mechanica
- Construction workshop
- Engine test bed and static and machine-mounted instrumentation for performance testing

### **Results include**

◆ **Salting/drying/smoking of meat products** with concentrated saline, sugar and acid solutions: laboratory studies for the development and patenting of industrial processes and equipment

◆ **Rolling and drying of starch products** : characterization, trialling of principles, construction of small-scale installations

◆ **Optimization of frying conditions** ; new frying applications

◆ **Effect of type of freezing** on pelagic fish quality.

### **Collaborations**

◆ ENSIA, ENSAM, INRA, ORSTOM, CEMAGREF, USTL

◆ Similar foreign and international organizations (ESP Dakar, FSA Cotonou, CIAE Bhopal, CENICAFE Colombia, CNRA Abidjan, UNESP Sao Paulo, Univalle Cali, etc.)

◆ CRITT, ANVAR

◆ Small and medium-sized companies and industries and agrifood groups (components manufacturers and processors of agrifood products)



## Current projects - *Collaborations are shown in brackets*

### Transformation processes

- Marinading of fish, crustaceans and molluscs
  - Creation of new products and assessment of their acceptability (industrial processors in metropolitan France and in French overseas departments and territories)
  - Application of the immersion under atmospheric pressure and pulsed vacuum process to the salting of poultry meat (trade association)
- Salting, drying, smoking of fish and of meat products
  - Establishment of draining charts for salting in solution (French equipment manufacturer)
  - Development of fillets of duck salted and dried by dewatering and impregnation soaking (French research centres)
  - Optimization of this process applied to an industrial installation (European manufacturer and processor)
  - Research into the possible use of the process in tropical and subtropical countries in small-scale production (Brazilian research centre, CRIT and small-scale producers in Réunion)
- Fruit drying and impregnation
  - Understanding of the physico-chemical phenomena involved in date drying (Algerian research centre)
  - Training in mango drying
  - Development of the process of manufacturing whole fresh or frozen semi-sugar-preserved fruit (French equipment and components manufacturer)
  - Research into the ageing and recycling of dewatering and impregnation soaking solutions
- Conservation and processing of starch products
  - Control of the small-scale process for the manufacture of dry yam roots and study of by-product uses (Benin, Ivory Coast, Nigeria, Belgium, Switzerland, as part of an INCO DC programme)
  - Study of the production process for rolled couscous-type products (Benin, Ivory Coast, Senegal)
- Frying
  - Study of transfers leat and mass during the frying of fine products
  - Fry-drying process for the manufacture of avocado and copra oil
- Immersion chilling and freezing
  - Modelling of heat and solute exchanges
  - Technical and financial study of the immersion freezing of fish on trawlers (Languedoc-Roussillon Region)
- Microbiological engineering
  - Use of lactic amyolytic bacteria (French manufacturers)

---

### Equipment

- Equipment design method
  - Development of methods and design tools in the countries of the South (Senegal, India, Colombia)
  - Post-factum analysis of design approaches (Senegal, Ivory Coast, Colombia, Vietnam, Tunisia)
- Training of partners in methods and applications
  - Design of a sesame seed huller (French manufacturer)
  - Fonio post-harvest equipment (Burkina, Guinea, Mali)
  - Methodological and technical support for the design of equipment for processing plant by-products in culture substrate
- Equipment development studies
  - Adaptation of salting-drying equipment to the countries of the South (Réunion, Madagascar)
  - Design and industrialization of salting-drying and marinading equipment (French manufacturers)
  - Instrumentation and automation of a semi-sugar-preserving installation
  - Instrumentation and automation of rice dryers (French components and equipment manufacturers)
  - Methane fermenters and biological filters
  - Construction of pilot equipment to reproduce industrial processes (hot air dryers, concentrator, hydrocyclone, liquid / solid contactor, etc.)

# **CIRAD-AMIS - AGRIFOOD SYSTEMS PROGRAMME**

**Food and Non-Food Materials Science (SMANA) Team**

## **SMANA**

**Head:** Jean GRAILLE

**Tel:** 33(0)4 67 61 58 81

**Fax:** 33(0)4 67 61 55 15

**E-mail:** jean.graille@cirad.fr

### **Fields of activity**

◆ Foodstuff quality and safety (oilseed products, meat products, starch products, fruit and vegetable by-products)

◆ Development of new analytical methods

◆ Research into vegetable and animal fats: chemical structure, properties, general and specific applications

◆ Research into new applications for industrial enzymes (papain, bromelain, lipases, etc.)

◆ Development of biomaterials for coating and packing

◆ Training in oil and fat technology

### **Human resources**

◆ 5 D.Sc.s with university accreditation as research supervisors

◆ 3 D.Sc.s

### **Technical tools**

#### **◆ Laboratories**

- distillation 311
- biotechnology 315
- chromatology 334
- large-scale prep. 335
- aroma chemistry 318
- physical measurements 321

### **Results include:**

◆ Design of a new type of palm oil mill: DRUPALM™ process

◆ Enzyme-assisted extraction of palm- and coconut oil

◆ Synthesis of new molecules, in particular surface agents

◆ Use of sugars, proteins and polyphenols through lipophilization

◆ Study of Brazil nut health food formulations

◆ Development of gluten-free bread-making mixtures from sour cassava starch

◆ Improvement in the quality of fish refrigerated or frozen on fishing boats.

◆ Improvement in the quality of fruit juice (mango) and the life of fresh fruit (lychees)

### **Collaborations**

◆ INRA, Universities, CNRS, ORSTOM

## **Contracts completed in 1998**

Microwave frying

Coating wax

N acylation of amino acids

Lipophilization of wheat gluten

Brazil nuts

---

## **Current contracts and studies**

Hydrophobation of vegetable proteins

Assessment of the uses of papain

Carotene deficiencies

Non-saponifiable palm oil concentrates

Improvement in the quality of refrigerated, marinated and frozen seafood products (fish, prawns)

Assessment of the uses of mango juice

Cool storage of lychees in modified atmosphere

Various industrial expert reports

Biopackaging

# **CIRAD-AMIS – AGRIFOOD SYSTEMS PROGRAMME**

**Physico-Chemistry, Bioenergy and Metrology (PCBM) Team**

## **PCBM**

**Head:** Daniel PIOCH

**Tel:** 33(0)4 67 61 58 82

**Fax:** 33(0)4 67 61 55 15

**E-mail:** daniel.pioch@cirad.fr

*The PCBM research unit combines complementary areas of expertise from a scientific viewpoint, which allows it to adopt a multidisciplinary approach to the processing and use of agrifood products in industry and in power generation. Such activities are part of the dual perspective of the rational use of natural resources (energy and raw materials) and a reduction in the pressure of industrial processing activities on the environment (environment-friendly, economical processes).*

## **Fields of activity**

◆ **New processes for treating agrifood products:** membrane processes, heterogenous catalysis, fermentation in a solid medium

◆ **Bioenergy and heat engines:** bioenergy, biofuels, engines, boilers, energy engineering

◆ **Industrial use of agrifood products and co-products:** lipochemistry, surface agents, biodegradable lubricants, additives, used frying oil, briquettes, factory effluents

◆ **Development of new products:** synthesis, formulation, study of chemical and physico-chemical properties

◆ **Development of measurement and analysis facilities and methods:** metrology, instrumentation, analytical chemistry, biofuels

◆ **Training:** hosting foreign scientists and students, teaching in universities and schools of higher education

## **Human resources**

◆ 4 executive staff (including 1 university-accredited research supervisor) and 3 technicians

## **Technical tools**

### ◆ **Laboratories**

- rheology 119
- synthesis and preparations 306
- hydrogenation 316
- GPC 333
- metrology laboratory

◆ Engine test bed

◆ Energy unit

◆ Library

Engine test bed, gas combustion and analysis, long-term testing, bioenergy testing unit, metrology laboratory

## **Collaborations**

◆ Universities and schools of higher education

◆ CNAM, CNRS, IFP, ITERG, ORSTOM, AIT (Bangkok), Palm Oil Research Institute of Technology (Kuala Lumpur)

◆ Small and medium-sized companies and industries, agrifood groups: John Deere, Renault, PSA, Sucrerie Distillerie d'Artenay and cooperatives

## **Current projects**

see next page

## **Areas of expertise**

Organic synthesis, continuous fixed catalytic bed reactors, closed reactors (production of samples for industry) Extraction, analysis and identification of compounds (chromatography, NMR, etc.)

## Current projects

### Processes for treating agrifood products - Application of membrane technology / vegetable or animal oils

- Refining of vegetable oils by microfiltration
  - New application for technological quality olive oil
  - Refining and fractionating of marine oils by filtration (biologically active polyunsaturated fatty acids)
  - Production of coconut-type aroma by fermentation in a solid medium
- 

### Bioenergy / Research

- Formulation and quality of biofuels (ethanol, vegetable oils) for engines and burners
  - Effect of the chemical composition of biofuels and sources of bioenergy on the efficiency of energy production systems
  - Process for producing ethylic esters from cotton and formulated fuels (ethanol/esters/diesel oil); inter-industry synergy in West Africa
  - Simplified processes for the production of vegetable oils-fuels (home consumption by producers)
  - Research into reducing the pollution caused by biofuel combustion
- 

### Bioenergy / Field experimentation - demonstration - rural development

- Adaptation of generators (5 to 1000 kW) to the production of electric power for industrial use from vegetable oils (e.g. cotton in West Africa)
  - Copra oil-fuel industry (New Caledonia, Fiji, production of electric power in an island environment)
  - Energy analysis of power uses in rural areas
  - Study of hybrid solar-heat engine applications in post-harvest processes
  - Use of by-products as a firewood substitute in rural areas (briquettes, sugar cane, cotton)
  - Gazification of agricultural by-products (rice bran)
  - Demonstration platform in a real (project) environment with the participation of components manufacturers (multifuel engines, oleaginous biomass, Brazil chestnut, wild palms, Amazonia)
- 

### "Green" chemistry/synthesis, properties/diversification of lipochemical production

- Branched chain cationic surface-active agents (biocides, foaming/antifoaming agents)
  - Branched chain esters to replace petroleum products for biodegradable fats (agrifood industry, railway network)
  - Sulfonated detergents and lubricants derived from lipoketones
  - Functionalized chain compounds oxygenated by heterogenous catalysis (biodegradable lubricants, fuel additives)
  - Intermediate lipochemicals derived from fatty acid esters
  - Emulsions of vegetable oils stabilized with beta-cyclodextrin
- 

### Metrology

- Field instrumentation (animal traction, motorized equipment)
- Monitoring/control of agrifood industry processes (automation of the preparation of selected seeds)
- Development of new sensors (soil analysis, laser profilograph, agrifood processes)
- High frequency data acquisition for the study of rapid phenomena

## Food Socio-Economics (SEA) Team

### SEA

**Head:** Nicolas BRICAS

**Tel :** 33 (0)4 67 61 57 12

**Fax :** 33 (0)4 67 61 44 49

**E-mail:** nicolas.bricas@cirad.fr

*The SEA team is primarily involved in multidisciplinary research and development projects in liaison with other ASP teams or CIRAD programmes. It analyzes changes in food consumption and urban markets and identifies the quality requirements of consumers. The team develops survey and analysis methods using the determinants of food demand, quality management and coordination of the different players involved in the agrifood sector*

### Fields of activity

The activities of the team's scientists are essentially divided between two projects:

- PROSPER (Prospects and Business-Research Partnership)
- URBAL (Urbanization and Food)

- ◆ Food changes associated with urbanization
  - systems for monitoring changes (observatories)
  - surveys

- ◆ Management or support of projects to promote local products and companies
  - quality improvement
  - diversification of use
  - marketing strategies

- ◆ Training

- ◆ Agrifood system databases

- ◆ Programming of agrifood systems research
  - sector-based diagnoses
  - research-action approaches

### Human resources

- ◆ 3 permanent executive staff including 2 expatriate staff members attached to the PROSPER Unit

- ◆ 2 doctoral students

- ◆ 1 fixed-term contract until March 1999

- ◆ 1 temp until Nov. 1998

- ◆ 1 part-time personal assistant

### Collaborations

- ◆ Internal to CIRAD: TERA A.F. Prog.; CA Calim Prog., EMVT

- ◆ France and Europe: INRA (ESR Montpellier, CORELA Ivry, UREQUA Le Mans), ORSTOM (LNT Montpellier, LEA Montpellier); IAM Montpellier, ENSA Montpellier, CNEARC, EHES-CNRS (GSPM Paris); ENSAM Paris, Univ. Montpellier 1 and 2, Versailles St Quentin, Paris X, GRET, PEGASE Développement, Univ. Louvain (Belgium), INDIA (Portugal), ETH Zurich (Switzerland)

- ◆ Countries of the South: CERNA (Benin), LESOR-Univ. Bouaké and Univ. Abidjan (Ivory Coast); ENDA-GRAF and IRIS (Senegal); IRAD, ENSAI and AGROPME

(Cameroon); CNRST and Univ. Ouaga (Burkina), ARC and CSIR (South Africa); UNESP (Brazil); ESIMAQ (Morocco); INN (Vietnam)

- ◆ CGIAR centres: IITA, CIAT, CIP, IFPRI

### Research networks and groups

- ◆ CIRAD representative for TPA network

- ◆ Research group on coordination in agrifood subsectors and markets (GECO) (CIRAD, INRA, ENSA.M, Univ. Mpl 1)

- ◆ Agrifood research group (GRAAL) (CIRAD, IAM, ENSA.M, Univ. Mpl 2)

# ***CIRAD-AMIS - AGRIFOOD SYSTEMS PROGRAMME***

**Food Socio-Economics Team**

## **Current projects (URBAL)**

<b>Short title</b>	<b>Funding</b>	<b>CIRAD partners</b>	<b>External partners</b>	<b>Fields</b>
INCO ALISA	EC INCO DC	TERA-PAF	Univ. Berlin	Senegal, Benin Burkina
ATP Urban food supplies in Africa	ATP CIRAD	FLHOR, TERA CA	INRA, Univ. St Quentin	Cameroon Guinea
INCO Urban market for small and medium-sized companies	EC INCO DC	TERA	GRET ORSTOM	Senegal Cameroon
Viet. food observatory	AI CIRAD	AMIS-ECOPOL	Univ. Ghent	Vietnam
Yams for urban markets	MAE C.& F.	CA-Calim	ORSTOM	Ivory Coast, Benin Togo, Burkina, Cameroon, Ghana
INCO Yam quality	EC INCO DC	CA-Calim	Univ. Louvain ETH	Benin, Ivory Coast Nigeria
AMATALA	MAE	TERA-PAF	INRA	South Africa
Study of potential cassava markets	FAO, CFC, IDRC		NRI	All countries
INPHO	FAO	CA-Calim	GTZ	All countries

## **Principal scientific publications**

◆ "Urbanisation, alimentation and filières vivrières" series

◆ 8 scientific publications in 1998

- INCO ALISA: Food, know-how and food processing innovations in West Africa; food observatories
- Urban food supplies in Africa; the organizations at the heart of the adjustments
- Development of urban markets for small and medium-sized agrifood companies
- Food and nutrition monitoring in Vietnam
- Promotion of yam-based products for urban markets
- Post-harvest treatment of yams, multidisciplinary approach to quality
- Promotion of the agricultural products of small farmers in South Africa
- Study of potential markets for cassava
- Information Network in Post-Harvest Operations

# ProsPER Southern South America

Prospects and Business-Research Partnership  
with the countries of southern South America  
in the agrifood sector

## Mission :

- To support technology transfers between France and the countries of southern South America: Brazil, Argentina, Paraguay, Uruguay and Chile - in the agrifood sector.

## Objectives :

- To back up investment by French companies in the countries of southern South America, encouraging business partnerships
- To exploit research results by transfers to industry and university-business collaboration
- To support training for top-level specialists in agrifood systems.

## Organization :

- Establishment at Campinas SP/Brazil through the joint efforts of the French Ministry of Foreign Affairs and the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD).
- Attached to the **ProsPER-France** Unit, part of CIRAD-AMIS in Montpellier.
- In southern South America, the project represents the agrifood systems programme of the French Regional Cooperation Agency based in Santiago, Chile.

## Other ProsPER Southern South America project activities

### - Research and Development operations :

- Identifying business opportunities
- Establishing scientific, technical and funding files
- Finding industrial and commercial partnerships
- Transfer of results

### - Training for specialists :

- Organizing technical/scientific meetings and seminars
- Organizing short-term professional training courses
- Network support for scientists and university staff

### - Communication and information :

- Inventory of invitations to tender
- Identifying opportunities for collaboration and technology transfer
- Collaboration and technology transfer opportunities and invitations to tender
- Participating in the main agrifood sector events in southern South America

**ProsPER Southern South America**  
Rua Barreto Leme, 1845  
13010-202 Campinas SP – Brazil  
Tel: (019) 251 13 03 / (019) 255 71 35 – Fax: (019) 255 71 35  
[pallet@lexxa.com.br](mailto:pallet@lexxa.com.br) **ADEPTA correspondent in Brazil**  
[guy.henry@lexxa.com.br](mailto:guy.henry@lexxa.com.br)  
Web site: [www.cendotec.com.br/prosper](http://www.cendotec.com.br/prosper)

**ProsPER France – CIRAD AMIS**  
BP 5035 – 34032 Montpellier Cedex 1 – France  
Tel: 33 (0)4 67 61 57 07 – Fax: 33 (0)4 67 61 44 55  
[gerard.chuzel@cirad.fr](mailto:gerard.chuzel@cirad.fr) – [griffon.d@cirad.fr](mailto:griffon.d@cirad.fr)  
Web site: [www.cirad.fr](http://www.cirad.fr)



## **The ProsPER Southern South America project**

### **at the service of French companies**

The **ProsPER Southern South America** project works hand in hand with French agrifood companies in their projects with the countries of southern South America: Brazil, Argentina, Chile, Paraguay and Uruguay.

The project intervenes downstream of the contacts made with French public organizations (Embassy, PEE, Chamber of Commerce, CFCE, ADEPTA, etc.) or international agencies (UNIDO, etc.) for technical and/or economic actions.

The areas of intervention concern not only agrifood processing (meat, milk, fruit and vegetables, root and tuber crops, cereals, etc.) but also agro-industrial equipment (project engineering, etc.)

**ProsPER Southern South America** is based in Brazil, in the state of Sao Paulo, enabling rapid and effective action to be taken throughout the area in question. A **ProsPER-France** Unit located at CIRAD, Montpellier gives full logistic and contractual support.

Each intervention is made on the basis of a French contract with the **ProsPER-France** Unit; the French company participates in the cost of local studies. The agreements include guaranteed confidentiality and exclusivity clauses.

**ProsPER** maintains close contacts with the business and professional associations, universities and technology centres in all countries of southern South America. Information and business opportunities are continuously updated.

## **ProsPER Southern South America**

### **backs up the French company**

### **at each stage of the project**

#### **-1- Organization of partnerships**

- Technology watch and visits by specialist companies
- Finding partners: industrial or commercial
- Finding subcontractors, etc.
- Setting up joint ventures

#### **-2- Technical/financial studies**

- Calculating running costs (raw materials, additives, labour, power, etc.)
- Calculating investment costs (equipment, buildings, etc.)
- Sector-based studies
- Market surveys (price, competition, quality, standards)
- Technical/financial feasibility studies

#### **-3- Support for the investment**

- Project engineering
- Choice and selection of subcontractors
- Training of partners



**ESIMAQ is one of Morocco's leading schools of higher education, specializing in quality management. It was created on the initiative of Moroccan industrial sponsors and a number of French and international agencies: the Ecole Nationale Supérieure d'Arts and Métiers (ENSAM), the Fondation pour l'Innovation et la Recherche Internationale en Europe (INRIE) and the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD). The backing of ESIMAQ by industrial manufacturers since its creation ensures that the training provided corresponds to industrial reality. The manufacturers are actively involved in the teaching and scientific boards and in the development of teaching programmes and lines of research.**

ESIMAQ's director is Stéphane DEGRES, an Agrifood Systems Programme scientist.

#### **ESIMAQ activities :**

- Initial general quality management training (for students with a baccalaureat in science),
- 1-year professional in-service training for executives and supervisory management, with support for quality projects,
- Business consultancy and support,
- Industrial research activities under the aegis of the ENSAM new product design laboratory in Paris and the AMIS Department of CIRAD,
- Long and short workshops/seminars,
- ENSAM (Paris) degree course: Master's degree in Quality Management,
- "A la carte" contributions in accordance with specific business requirements.

#### **Major business customers :**

MAPHAR (Sanofi) / INAAM Provimi / PHARMA 5 / C.M.G. (Groupe Ona pôle mine) / C.T.T. (Groupe Ona pôle mine) / MANAGEM (Groupe Ona pôle mine) / S.M.I. (Groupe Ona pôle mine) / SAMINE (Groupe Ona pôle mine) / Groupe des Brasseries du Morocco / AKZO-NOBEL COATINGS SAM / Banque Centrale Populaire / BMAO / Centrale Jorf Lasfar / COSUMAR / L'Alliance africaine / OCP / OFPPT / ONE / Pechiney M.M.A. / RAM / REMINEX / S.G.S.-THOMSON / S.N.V. / SERAM (ENSAM/Paris) / SOMANA.

See next page for list of courses.

#### **INFORMATION**

**Address: 56 rue Ibnou Hamdis – Casablanca - Morocco**

**Tel: (212 2) 36 92 27 - Fax: (212 2) 94 00 37**

**E-mail: [esimaq@plvplus.net.ma](mailto:esimaq@plvplus.net.ma)**

## **<sup>1</sup>Training courses**

1. General introduction to quality management (12h)
2. Introduction to quality tools (60 h)
3. Participatory methods (60 h)
4. Management and quality assurance (60 h)
5. Metrology and maintenance (60 h)
6. Hygiene, safety and the environment (60 h)
7. Statistical process control (60 h)
8. Analysis of specific industrial situations (60 h)
9. Service quality (20 h)

## **Topics**

- ➔ Functional analysis (12 h)
- ➔ Failure mode effect and criticality analysis (FMECA, product, process, project) (12 h)
- ➔ Experimental designs (12 h)
- ➔ Practical statistics (12 h)
- ➔ Quality tools (12 h)
- ➔ New product design (12 h)
- ➔ Operational reliability (12 h)
- ➔ Total quality (12 h)
- ➔ ISO 9000 standards (12 h)
- ➔ ISO 14000 standards (12 h)
- ➔ Audit methods (12 h)
- ➔ Participatory management (12 h)
- ➔ Metrology (12 h)
- ➔ Maintenance (12 h)
- ➔ Statistical planning and prospects (16 h)
- ➔ Management of non-quality costs
- ➔ Food hygiene and industrial hygiene
- ➔ Communication policy
- ➔ Laboratory accreditation.

## **ORGANIC ANALYSIS SERVICE**

contact : Georges Piombo (Tel : 04 67 61 58 26)

### **TYPES OF ANALYSIS PERFORMED**

Analyses are essentially of three types :

- Preparations of samples: extraction methods
- Gravimetric analyses
- Analyses by ion chromatography

In the following fields :

- Fibres : hemicelluloses, cellulose, lignin
- Carbohydrates : monosaccharides, disaccharides, oligosaccharides and starches
- Anions : organic and mineral

The management of samples and analyses follows a standard pattern: traceability of requests, samples, operational procedures and records.

### **COST OF ANALYSES**

Scientific organizations external to CIRAD are billed according to a standard tariff covering the cost of equipment depreciation, consumables, technician time, etc. Departments of the CIRAD programmes are sent a debit note representing 40% of the overall price.

### **STAFF**

G. PIOMBO

I. METAYER

D. DIJOUX (temporarily replacing A. CASABELLA)

## EXPATRIATE STAFF

### **Dominique PALLET - BRAZIL**

Rua Lupercio de Arruda Camargo, 797 c / 262  
13089 - 580 Campinas - SP Brazil  
Tel/Fax: 00 55 19 256 36 36

E-mail: pallet@lexxa.com.br

Prospects and  
Business-Research Partnership  
(PROSPER Unit) in the countries  
of southern South America

### **Guy HENRY - BRAZIL**

Rua Dr Paulo Castro Pupo  
Nogueira, 600 Campinas SP  
CEP 13092 - 400 Brazil

Tel: 00 55 19 251 13 03

E-mail: guyhenry@lexxa.com.br

Prospects and  
Business-Research Partnership  
(PROSPER Unit) in the countries  
of southern South America

### **Nadine ZAKHIA-ROZIS - COLOMBIA**

CIAT - Proyecto de Desarrollo de  
Agroempresas rurales  
AA 6713 - Cali - Colombia  
Tel: 00 57 2 445 00 22  
Fax: 00 57 2 445 00 73  
E-mail: n.zakhia@cirad.fr

Diagnoses of small-scale  
agrifood processing systems  
within the framework  
of the CIAT Rural Agro-  
Industries project

### **Stéphane DEGRÉS - MOROCCO**

ESIMAQ - 56 rue Ibnou Hamdis,  
Quartier Raffine Extension  
Casablanca - Morocco  
Tel: 00 212 2 36 92 27  
Fax: 00 212 2 94 00 37  
E-mail: stephane.degres@cirad.fr

Director of the ESIMAQ  
School of Quality Management

### **Antoine COLLIGNAN - Réunion**

CIRAD - Station la Bretagne - BP 20  
97408 Saint Denis Messagerie cedex  
Réunion  
Tel: 00 262 92 24 47  
Fax: 00 262 52 80 21  
E-mail: antoine.collignan@cirad.fr

Meat products processing  
in Réunion, Madagascar,  
South Africa

### **Didier MONTET - THAILAND**

AIT - Bioprocess Technology Program  
PO Box 4 Klong Luang, Pathumthani  
12120 - Thailand  
Tel: 00 662 524 65 91  
Fax: 00 662 524 61 11  
E-mail: montet@ait.ac.th

Biotechnology  
Research and development  
at AIT

Last updated : 27/05/1999

**STAFF REGISTER**

**AGRIFOOD SYSTEMS PROGRAMME**

**CIRAD - AMIS**

## Agrifood Systems Programme Teams

*Anne Lucie Wack*  
*Head of Programme*



*Florence Jeanjean*  
*Personal assistant of Head of Programme*  
*(On sabbatical leave Sept. 1998 to August 1999)*



*Marie-Catherine Champanay*  
*Personal assistant of Head of Programme*  
*(Replacing F. Jeanjean)*



**Jean-Michel Méot**  
*GPE team*  
*Process engineering*  
*and equipment design*



**Jean Graille**  
*SMANA team*  
*Food and non-food*  
*Materials science*



**Daniel Pioch**  
*PCBM team*  
*Physico-chemistry*  
*Bioenergie, Metrology*



**Nicolas Bricas**  
*SEA team*  
*Food*  
*Socio-economics*



**Nadine Lopez**  
*Secretary*



**Marie-Pierre Obède**  
*Secretary*



**Isabelle Chalon**  
*Secretary*



**Pascale Morin**  
*Secretary*



**BERGERET Alain -**



Engineer in industrial art and design (ENSAM)  
*Valuation (contracts), patent rights, industrial  
agricultural and agrifood processes, other fields  
of technology*

Contact details : Building 16 - Room 118  
Tél : 04 67 61 57 64- Fax : 04 67 61 44 49 -  
Mél. : alain.bergeret@cirad.fr

**BRU Christian -**



Supervisor  
*Technical and administrative management of  
resources, pilot plant workshops, laboratories,  
equipment, consumables*

Contact details : Building 15 room 218  
Tél : 04 67 61 57 22 - Fax : 04 67 61 12 23 -  
Mél. : christian.bru@cirad.fr

**BOHUON Philippe -**



D.Sc. in energetics and process engineering  
Lecturer ENSIA-SIARC  
Associate researcher ENSIA-SIARC-CIRAD  
*fish, meat products, dewatering and impregnation  
soaking, refrigeration*

Contact details : Building 16 - Room 141  
Tél : 04 67 61 57 26 - Fax : 04 67 61 44 49 -  
Mél. : philippe.bohuon@cirad.fr

**CASABELLA Anne -** Senior laboratory technician

*Organic analyses*

Contact details : Building 1 - room 27  
Tél : 04 67 61 58 00 poste 5282 - Fax : 04 67 61 65 09

**BRICAS Nicolas -**



Research engineer  
*Head of Food Socio-Economics (SEA) team  
Economics, food consumption science*  
Contact details : Building 16 - room 40  
Tél : 04 67 61 57 12 - Fax : 04 67 61 44 49 -  
Mél. : nicolas.bricas@cirad.fr

**CHALON Isabelle -**



Secretary  
Secretary of Physico-Chemistry, Bioenergy and  
Metrology (PCBM) team  
Contact details : Building 16 room 309  
Tél : 04 67 61 55 14 - fax 04 67 61 55 15 -  
Mél : isabelle.chalon@cirad.fr

**BROUAT Jacques -**

Senior technician, design office  
Draughtsman / designer  
*Equipment design*  
Contact details : Building 15 - room 216  
Tél : 04 67 61 57 77 - Fax : 04 67 61 59 55  
Mél. : jacques.brouat@cirad.fr

**CHAMPANAY Catherine -** Personal assistant

*Head of Programme secretariat*

Contact details : Building 16 room 110  
Tél : 04 67 61 57 33 - Fax : 04 67 61 44 49  
Mél : marie-catherine.champanay@cirad.fr



**CHUZEL Gérard -**

D.Sc. In food science

Research engineer

***Prospects and Business-Research Partnership***

Contact details : Building 4, room 224 bis

Tél : 04 67 61 57 59 - Fax : 04 67 61 44 55

Mél : [gerard.chuzel@cirad.fr](mailto:gerard.chuzel@cirad.fr)



**COLLIGNAN Antoine -**

D.Sc. In mechanical engineering and energetics

Research engineer

***Process engineering/processing of meat products, seafood products (fish, crustaceans, cephalopods), salting, drying, marinading, ripening, smoking***

Adress : Station la Bretagne BP 20

97408 Saint denis Messagerie Cx - 9La Réunion

Tél : 00 262 52 80 20 - Fax : 00 262 52 80 21

Mél. : [antoine.collignan@cirad.fr](mailto:antoine.collignan@cirad.fr)

**DEGRES Stéphane -**

D.Sc. in industrial art and design (ENSAM)

Doctorate in equipment design methods

***Equipment design, establishment of a quality management school in Morocco, research into equipment design methods for the countries of the South***

Adress : ESIMAQ, 56 rue Ibnou Hamdis, Quartier

Raffine extension , Casablanca Maroc

Tél : (212-2) 36 92 27 - Fax : (212-2) 94 00 37

Mél. : [stephane.degres@cirad.fr](mailto:stephane.degres@cirad.fr)



**DEUMIER François -**

Engineer in biostatistics ENSAR / DEA

ENSAM/USTL

CIFRE research funding

***Process engineering, meat products (meat, poultry, fish) dewatering and impregnation soaking***

Contact details : Building 15 room 205

Tél : 04 67 61 57 24 - Fax : 04 67 61 12 23

Mél. : [francois.deumier@cirad.fr](mailto:francois.deumier@cirad.fr)



**DIJOUX Daniel -**

Technician

***Food quality analysis***

Contact details : Building 16 room 138

Tél : 04 67 61 57 78 - Fax : 04 67 61 44 49

Mél. : [daniel.dijoux@cirad.fr](mailto:daniel.dijoux@cirad.fr)



**DUFOUR Dominique -**

D.Sc. in biotechnology

Research engineer

***Cassava starch biotechnologies***

contact details : Building 15 room 206

Tél : 04 67 61 57 19 - Fax: 04 67 61 12 23 -

Mél.: [dominique.dufour@cirad.fr](mailto:dominique.dufour@cirad.fr)

**DUMAS Jean-Claude -**

Engineer ENSBANA

Research engineer

***Fruit processing, avocado oil extraction, equipment performance monitoring***

Contact details : Building 15 room 207

Tél : 04 67 61 57 18 - Fax: 04 67 61 12 23 -

Mél : [jean-claude.dumas@cirad.fr](mailto:jean-claude.dumas@cirad.fr)



**FLEURIOT Jean-Paul -**

Technician , skilled worker

***Equipment construction, metals, plastics, sheet metal work, mechanics***

Contact details : Building 15 atelier

Tél : 04 67 61 57 75 - Fax: 04 67 61 12 23

Mél. : [jean-paul.fleuriot@cirad.fr](mailto:jean-paul.fleuriot@cirad.fr)



**FOUCHER Olivier -**

Technician

***Food quality analysis***

Contact details : Building 16 room 209

Tél. : 04 67 61 57 59 - Fax : 04 67 61 44 49

**GOLI Thierry -**

Research engineer

***Food technology, food quality, fish chilling/freezing***

Contact details : Building 16 room 113

Tél : 04 67 61 57 16 - Fax : 04 67 61 44 49

Mél. : thierry.goli@cirad.fr



**GALLET Philippe -**

Senior technician

***Metrology, instrumentation, monitoring/control***

Contact details : Building 15 room: lab.

Tél : 04 67 61 57 74 - Fax : 04 67 61 12 23

Mél.: philippe.gallet@cirad.fr



**GOUNELLE Denis -**

Head of workshop

***Equipment design/construction, sheet metal work, mechanics, electrical engineering***

Contact details : Building 15 workshop

Tél : 04 67 61 57 75 - Fax: 04 67 61 12 23

Mél : denis.gounelle@cirad.fr



**GIBERT Olivier -**

Senior laboratory technician

***Technical support for pilot plant workshops and laboratories, process engineering, food science, biochemistry, fish, all types of products, spray systems, chilling and freezing, sorption***

Contact details : Building 16 room 137

Tél : 04 67 61 57 78 - Fax : 04 67 61 44 49

Mél. : gibert.o@cirad.fr



**GRAILLE Jean -**

University-accredited research supervisor, D.Sc. in chemistry, Head of Food and Non-Food Materials Science (SMANA) team

***Physico-chemistry, product processing, chemistry of fatty bodies***

Contact details : Building 16 room 354

Tél : 04 67 61 58 81 - Fax: 04 67 61 55 15

Mél. : jean.graille@cirad.fr

**GONTARD Nathalie -**

D.Sc. in food science

Associate researcher ENSIA-SIARC-CIRAD

***Biodegradable packaging***

Contact details : Building 16 room 142

Tél : 04 67 61 57 05 - Fax: 04 67 61 12 44 49

Mél. : nathalie.gontard@cirad.fr



**GIROUX François -**

Engineer (Ecole Centrale) D.Sc. in process engineering, Director ENSIA SIARC

Associate researcher ENSIA-SIARC-CIRAD

***Equipment design, process monitoring/control, equipment for agricultural and agrifood industries, control of dewatering and impregnation soaking syrup recycling processes***

Contact detail : Building 15 room 217

Tél : 04 67 61 71 71 - Fax: 04 67 61 12 23

Mél. : francois.giroux@cirad.fr



**HEBERT Jean-Paul -**

D.Sc. in biochemistry, university-accredited  
research supervisor  
Professor ENSIA-SIARC  
Associate researcher ENSIA-SIARC / CIRAD  
***Training, development and coordination of  
product research, processes and equipment***  
Contact details : Building 15  
Tél : 04 67 61 65 89 - Fax: 04 67 61 12 23  
Mél. hebert.jp@cirad.fr

**HENRY Guy-**

D.Sc. in agricultural economics  
***Economics, sociology  
Prospects and Business-Research Partnership  
(PROSPER), southern South America***  
Address : rua Dr. Paulo Castro Pupo Nogueira,  
600 Campinas-SP, CEP 13092-400 Brésil  
Tél : 00 55 19 251 13 03  
Mél : guyhenry@lexxa.com.br

**JEANJEAN Florence -**

Personal assistant  
*On sabbatical leave Sept. 1998 to August 1999*  
***Head of Programme secretariat***  
Contact details : Building 16 room 110  
Tél : 04 67 61 57 33 - Fax: 04 67 61 12 44 49  
Mél : florence.jeanjean@cirad.fr

**LAHON Marie-Christine -** Senior laboratory technician - agricultural and  
agrifood industries



***Microbiology, process engineering,  
microbiological analysis, drying, salting,  
marinading, smoking***  
Contact details : Building 15 room 210  
Tél : 04 67 61 57 23 - Fax : 04 67 61 12 23-  
Mél. : marie-christine.lahon@cirad.fr

**LIENNARD Alain -**



Engineer ESTACA  
Research engineer  
***Bioenergy***  
Contact details : Building 15 room 215  
Tél : 04 67 61 56 54 - Fax : 04 67 61 12 23  
Mél : alain.liennard@cirad.fr

**LOISEAU Gérard -**



D.Sc. in microbiology  
Lecturer ENSIA SIARC, microbiology teaching and  
research  
Associate researcher ENSIA-SIARC / CIRAD  
***Starch products, all types of products, amylolytic  
lactic fermentation, all types of fermentation, cow***  
Contact details : Building 16 room 114  
Tél : 04 67 61 57 28 - Fax : 04 67 61 44 49  
Mél. : gerard.loiseau@cirad.fr

**LOPEZ Nadine -**

Secretary  
***Secretariat of Process Engineering and Equipment  
Design (GPE) team***  
Contact details : Building 15 room 209  
Tél : 04 67 61 65 97 - Fax : 04 67 61 12 23  
Mél. : nadine.lopez@cirad.fr

**LOZANO Paul -**



Research engineer  
***Engineer in chemistry / technology***  
Contact details : Building 16 room 310  
Tél : 04 67 61 59 98 - Fax : 04 67 61 55 15  
Mél : paul.lozano@cirad.fr

**LOZANO Yves**



University-accredited research supervisor, D.Sc. in chemistry  
***Chemistry, biochemistry, food science, fruit quality, aroma, colour, modified atmosphere***  
Contact details : Building 16 Room 319  
Tél : 04 67 61 44 47 - Fax : 04 67 61 44 33  
Mél: yves.lozano@cirad.fr

**MAROUZE Claude -**



Engineer in industrial art and design (ENSAM)  
Preparing thesis on equipment design methods  
***Equipment design and industrial engineering, agricultural and agrifood equipment, all fields***  
Contact details : Building 15 room 217 bis  
Tél : 04 67 61 57 61 - Fax : 04 67 61 12 23  
Mél: claudemarouze@cirad.fr

**MEOT Jean-Michel -**



Head of Process Engineering and Equipment Design (GPE) team  
D.Sc. in process engineering  
***Process engineering, cereals, root crops, all types of products, drying, sorption***  
Contact details : Building 15 Room 204  
Tél : 04 67 61 57 15 - Fax : 04 67 61 12 23  
Mél. : jean-michel.meot@cirad.fr

**MONTET Didier -**



University-accredited research supervisor, D.Sc. in biochemistry ; expatriate member of staff  
***Microbiology, enzymology, food biochemistry, quality***  
Address : Bioprocess Technology Program  
Asian Institute of Technology - PO Box 4 Klong Luang, Pathumthani 12120, Thaïlande  
Tél : (662) 524 65 91- Fax : (662) 524 61 11  
Mél. : montet@ait.ac.th

**MORIN Pascale -**



Secretary  
***Secretariat of Food Socio-Economics (SEA) team***  
Contact details : Building 16 room 26  
Tél : 04 67 61 55 37 - Fax : 04 67 61 44 49  
Mél. : pascale.morin@cirad.fr

**NGO Chan Bang**



Research engineer  
***Improvement of production systems, information systems, integrated regional development***  
Contact details : Building 15 Room 107  
Tél : 04 67 61 59 62 - Fax : 04 67 61 12 23  
Mél : ngo@cirad.fr

**OBEDE Marie-Pierre -** Secretary

***Secretariat of Food and Non-Food Materials Science (SMANA) team***  
Contact details : Building 16 Room 353  
Tél : 04 67 61 55 19 - Fax : 04 67 61 55 15  
Mél : marie-pierre.obede@cirad.fr

**PALLET Dominique -**

D.Sc. in process engineering  
Mechanical Engineer  
ROSPER project, southern South America  
(Prospects and Business-Research Partnership)  
Address : Rua Barreto Leme, 1845 - Apto 12  
13010-202 Campinas - SP Brésil  
tél / fax : 00 55 19 255 71 35  
Mél : pallet@lexxa.com.br

**PINA Michel -**

University-accredited research supervisor, D.Sc. in Chemistry  
*Chemistry of fatty bodies, nutrition*  
Contact details : Building 16 room 352  
Tél : 04 67 61 56 71 - Fax : 04 67 61 55 15  
Mél. : michel.pina@cirad.fr

**PIOCH Daniel -**

University-accredited research supervisor, D.Sc. in chemistry  
Head of Physico-Chemistry, Bioenergy and Metrology (PCBM) team  
*Membrane processes, bioenergy, lipochemistry, physico-chemistry*  
Contact detail : Building 16 Room 308  
Tél : 04 67 61 58 82 - Fax : 04 67 61 55 15  
Mél. : daniel.pioch@cirad.fr

**PIOMBO Georges -** Senior laboratory technician

*Analytical chemistry*  
Contact details : Building 16 room 351  
Tél : 04 67 61 58 26 - Fax : 04 67 61 65 09  
Mél : georges.piombo@cirad.fr

**RIVIER Michel -**



Senior technician (mechanical engineering)  
Design officer, draughtsman / designer  
*Agrifood equipment design, all types of processes*  
Contact details : Building 15 room 215 bis  
Tél : 04 67 61 57 67 - Fax : 04 67 61 12 23  
Mél. : michel.rivier@cirad.fr

**ROUSSEL Coralie -** Doctor, research engineer

*Bio-transformation*  
Contact details : Building 16 Room 312  
Tél : 04 67 61 55 18 - fax 04 67 61 55 15

**SOTTO Cécile -**

Technician  
*Food quality analysis*  
Contact details : Building 16 Room 209  
Tél : 04 67 61 57 59 - Fax : 04 67 61 44 49

**THAUNAY Patrice -** Senior technician (mechanical engineering)  
Design officer ; draughtsman / designer  
*Equipment design, agricultural and agrifood machinery*  
Contact details : Building 15 Room 216 bis  
Tél : 04 67 61 57 77 - Fax : 04 67 61 12 23 -  
Mél: patrice.thaunay@cirad.fr



**THOMAS Daniel -**

Senior laboratory technician  
*Organic analyses, organic synthesis*  
Contact details : Building 16 Room 313  
Tél : 04 67 61 58 27 - Fax : 04 67 61 65 09

**VAITILINGOM Gilles-** D.Sc. in physical sciences



**Bioenergy**

Contact details : Building 15 Room 208

Tél : 04 67 61 57 62 - Fax : 04 67 61 12 23

Mél. : gilles.vaitilingom@cirad.fr

**ZAKHIA-ROZIS Nadine** D.Sc. in food science - espatriate member of staff



***Processing and quality of starch and meat products***

Address : CIAT - Proyecto de Desarrollo de

Agroempresas rurales

AA 6713 - Cali - Colombie

tél : 00 57 2 445 00 22 - Fax : 00 57 2 445 00 73

Mél : n.zakhia@cirad.fr

**VALENTE Marc -**

D.Sc. in food science

***Fruit and vegetable quality, physico-chemistry, post-harvest***

Contact details : Building 16 Room 323

Tél : 04 67 61 44 35 - Fax : 04 67 61 44 33

Mél. : marc.valente@cirad.fr

**VITRAC Olivier**



Agrifood industries engineer

Research funding - Doctoral student

***Process engineering, characterization and modeling of frying as a unit operation***

Contact details : Building 16 Room 153

Tél : 04 67 61 65 72 - Fax : 04 67 61 44 49

Mél. : vitrac@cirad.fr

**WACK Anne-Lucie -**



Head of Agrifood Systems Programme

University-accredited research supervisor, D.Sc. in process engineering

***Osmotic dehydration, immersion impregnation, frying, chilling/freezing***

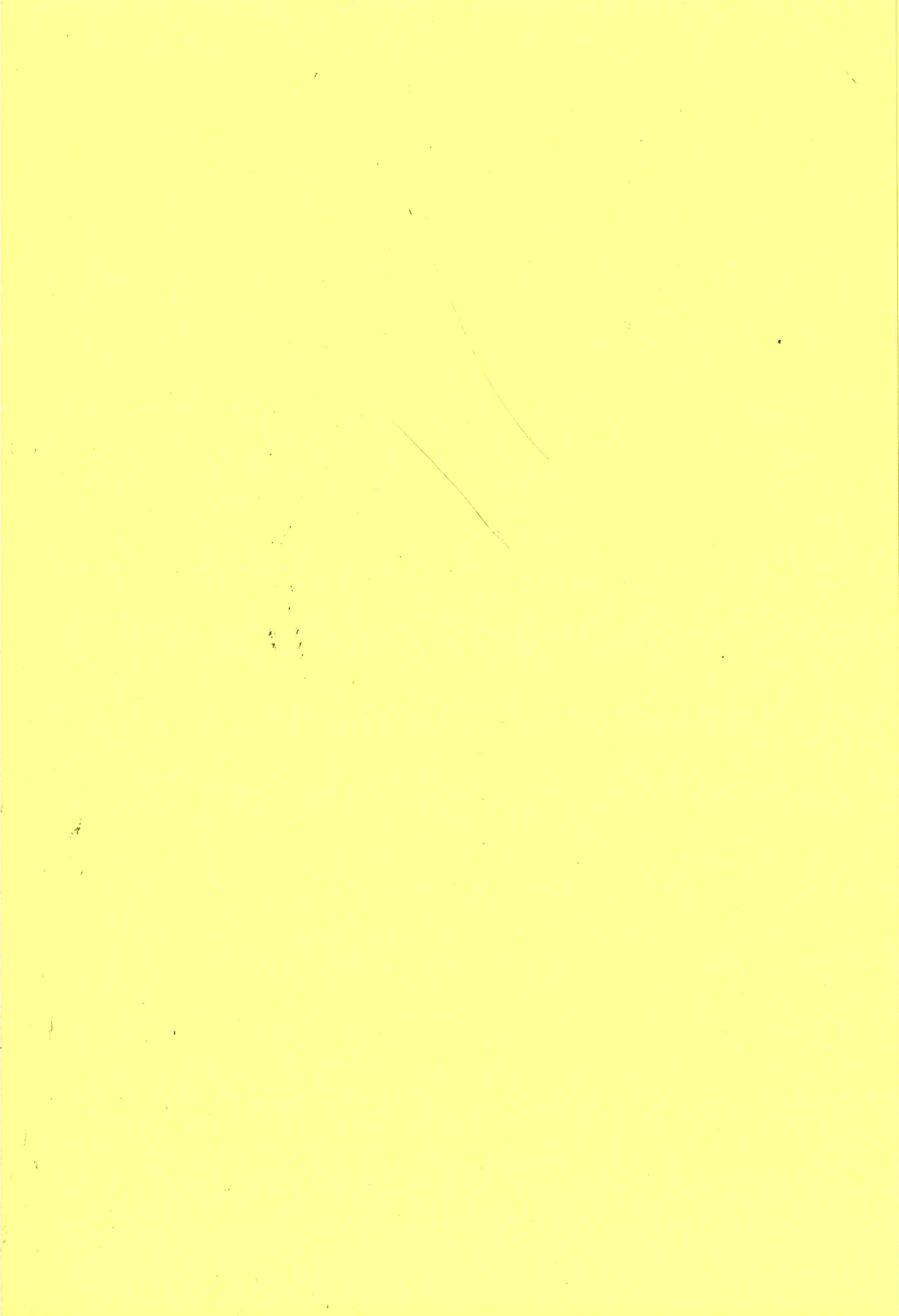
Contact details : Building 16 Room 112

Tél : 04 67 61 57 13 - Fax : 04 67 61 44 49

Mél. : anne-lucie.wack@cirad.fr

## **II. SCIENTIFIC PRODUCTS 1998**

- Activity indicators (1998)
- List of scientific publications (1998-1999)
- List of successfully defended theses and accreditations to supervise research (1998)
- List of training courses run by the ASP (1998)
- List of ASP research and development projects (1998)
- List of overseas missions
- Presentation of the Quality Assurance Programme





## **AGRIFOOD SYSTEMS ROGRAMME**

### **ACTIVITY INDICATORS (1998)**

The activities and scientific production of the ASP can be illustrated by the following indicators or "salient facts":

- ➔ **over 50 publications** (see attached list), including more than 20 in refereed journals.
- ➔ **5 doctoral theses and 2 accreditations to supervise research successfully defended** (see list)
- ➔ **supervision of 70 students** (final year of engineering degree course, DEA, Masters, or BTS- and IUT-type training)
- ➔ **over 40 R & D projects** with external funding, with a total of around 7 million FF of contractual resources. The ASP is involved in 8 European projects, for 3 of which it is the scientific coordinator, and is joint leader of 2 FAIR networks ("Cold Chain" and "osmotic treatments").
- ➔ **around 500 days of missions** (expert reports, congresses, project follow-ups) abroad (see attached list)
- ➔ **launch of a Quality Assurance Programme** (see attached description). Since its creation on 1 January 1998, the ASP has been engaged in a quality assurance programme, continuing the efforts made in previous years under the earlier structure. The Appendix contains information on what has been achieved to date (after the first year of implementation), with progress in particular on the following points:
  - reorganization of the analysis laboratories
  - inventory and management of all pilot plant workshop and laboratory equipment
  - writing of operational procedures
  - management of non-conformance and incident forms
  - development of safety rules.

## LIST OF PUBLICATIONS 1998 - 1999

### I. BOOKS OR SERIES

- 1998 BERTHAUD J., BRICAS N. et MARCHAND J.L. (Eds.) .L'igname, plante séculaire et culture d'avenir ; Actes du séminaire international Cirad, Inra, Orstom, Coraf, Montpellier, France, 3-6 juin 1997. Montpellier, France, CIRAD-INRA-ORSTOM-CORAF, 456 p.
- 1998 BRICAS N. Cadre conceptuel et méthodologique pour l'analyse de la consommation alimentaire urbaine en Afrique. Montpellier, France, CIRAD, Série Urbanisation, alimentation et filières vivrières n°1, 46 p.
- 1998 THUILLIER-CERDAN C. et BRICAS N. La consommation et la distribution alimentaire à Cotonou (Bénin). Montpellier, France, CIRAD, Série Urbanisation, alimentation et filières vivrières n°2, 44 p.
- 1999 ALARCON F., DUFOUR D. El almidon agrio de yuca en Colombia : recomendaciones y produccion. Tomo I. (sous presse)

### II. CHAPTERS OF BOOKS

- 1998 TOLLENS E., HENRY G. Future diversification of Cassava use in Africa : Lessons from Latin America and Asia. In : Cassava in Africa. J.P. Rafailac (ed.), ORSTOM éditions, Montpellier (forthcoming)
- 1998 MAESTRELLI A., TORREGIANI D., LUCAS T., RAOULT-WACK A.L., PHILIPPON J. Maximising quality and stability of frozen foods: A producers guide to the state of the art. Report 2: Factors affecting the quality of frozen fruit and vegetables. Ed. C.J. Kennedy and G.P. Archer, Concerted Action CT96-1180, 9-15.
- 1998 TORREGIANI D., LUCAS T., BLOND G., RAOULT-WACK A.L. Maximising quality and stability of frozen foods: A producers guide to the state of the art. Report 4 : Using pre-treatments to improve the quality of frozen foods. Ed. C.J. Kennedy and G.P. Archer, Concerted Action CT96-1180, 27-34.
- 1998 DUFOUR D., BRABET C. Les propriétés rhéologiques de l'amidon aigre de manioc en Colombie. In : Les agro-industries rurales en Amérique latine. Boucher F. & Muchnick J. Eds. Collection repères CIRAD, pp. 119-130.
- 1998 MONTET D., ZAKHIA N., MOUQUET C., LOISEAU G. Fermentation traditionnelle, Chapitre sur les végétaux et fruits fermentés, Coordinateur Dr Pandey (Inde). Biotechnologie : Food Fermentation, Editors VK Joshi & Ashok Pandey, Publishers Educational Publishers & Distributors, New Delhi.
- 1998 PIOCH D., LARGUEZE C., HAFIDI A., AJANA H., GRAILLE J. Membrane based vegetable oils refining crossflow filtration at laboratory and pilot scales. Word Conference on Oilseed and Edible Oils Processions : Editor S. Sefa Koseoglu and K.C. Rhee, American Oil Chemists' Society, Champaign, USA.
- 1998 HENRY G., BEST R., OSPINA B. (1998-1999). Development by linking small farmers to growth markets; The case of Cassava in Latin America. In : Sustainable Agriculture and Environment : Globalisation and trade liberalisation impacts. A. Gragun and C. Tisdell (eds). Edgar Elgar, Cheltenham, UK (in press)

### **III. PUBLICATIONS IN REFEREED FRENCH JOURNALS OR TECHNICAL JOURNALS**

- 1998 THRO A.M, ROCA W., HENRY G., IGLESIAS C., and S.Y.C. Ng. In-Vitro biology for Cassava, a small farmers' Crop. African Journal of Crop Science (in press)
- 1998 COLLIGNAN A., MONTET D. : Tenderizing squid mantle by marinating at different pH and temperature. In Lebensmittel Wissenschaft Technologie Journal, 31 (7) 673-679.
- 1998 DIAZ A., LISSE I., RAOULT-WACK A.-L., BRICAS N. Consumption trends of plantain chips and consumer appreciation of their quality in Cali (Colombia). Tropical Science, (38) : 171-178.
- 1998 KALILOU S., COLLIGNAN A., ZAKHIA-ROZIS N. Optimizing the traditional processing of beef into kilishi. Meat Science, 50 (1), 21-32.
- 1998 GAOUAR O., ZAKHIA-ROZIS N., AYMARD C., RIOS G.M. Production of maltose syrup by bioconversion of cassava starch in an ultrafiltration reactor. Industrial Crops and Products, 7, 159-167.
- 1998 CHAULIAC M., BRICAS N., ATEGBO E., AMOUSSA W., ZOHOUN I. L'alimentation hors du domicile des écoliers de Cotonou (Bénin). Cahiers Santé, (8) : 101-108.
- 1998 RAOULT-WACK A.-L., BRICAS N. Controllable development of the food sector in tropical areas : main challenges, fields of research and research procedures. Outlook on Agriculture, 27 (4) : 225-235.
- 1998 LUCAS T., RAOULT-WACK A.L. Immersion chilling and freezing in aqueous refrigerating media : review and future trends. International Journal of Refrigeration, 21 (6), 419-429.
- 1998 BOHUON P., COLLIGNAN A., RIOS G.M., RAOULT-WACK A.L. Soaking process in ternary liquids: experimental study of mass transport under natural and forced convection. Journal of Food Engineering, 37, 451-469.
- 1998 LISSE I., RAOULT-WACK A.L. (with technical support of O. GIBERT). Drying of meat materials (lean and fat) by deep fat frying. Sciences des Aliments, 18, 423-435.
- 1998 LAURENT S., SERPELLONI M., PIOCH D. : Study of cyclodextrin stabilised paraffin oil/water emulsions. Revue Society of Cosmetic Chemists.
- 1998 CUQ B., GONTARD N., GUILBERT S. Proteins as agricultural polymers for packaging production: a review. Cereal Chemistry, 75(1) 1-9.
- 1998 FRINGUANT C., RINAUDO M., GUILBERT S., DERRADJI H., GONTARD N. A biodegradable starch based coating to waterproof hydrophilic materials. Starch. 50, 292-296.
- 1998 POUPLIN M., REDL A., GONTARD N. Glass transition of wheat gluten proteins as a function of water, glycerol and sorbitol content Journal of Agricultural and Food Chemistry. In press.
- 1998 LE ROUX E., DOCO T., SARNI-MANCHADO P., LOZANO Y., CHEYNIER V. Type proanthocyanidins from pericarp of Litchi Chinensis. Phytochemistry, 48 (7), 1251-1258.
- 1998 GUYOT B., GUEULE D., PINA M., GRAILLE J., FARINES V., FARINES M. Enzymatic synthesis of fatty esters in 5-caffeoyl quinic acid. Biotechnology Letters. In press.
- 1999 TORREGIANI D., LUCAS T., RAOULT-WACK A.L. Pretreatments of fruits and vegetables. In : Managing Frozen Food ; Coord. C. Kennedy, ed. Woodhead Published Limited, Cambridge, U.K. In Press.

- 1999 DIAZ A., TRYSTRAM G., VITRAC O., DUFOUR D., RAOULT-WACK A.L. Kinetics of moisture loss and fat absorption during frying for different varieties of plantain. *Journal of the Science of Food and Agriculture*, 79 : 291-299.
- 1999 LUCAS T., FRANCOIS J., RAOULT-WACK A.L. Transport phenomena in immersion cooled apples. A paraître dans *International Journal of Food Science and Technology*. In press.
- 1999 AGNANGMA D.S., LENG M. S., NDJOUENKEU R., RAOULT-WACK A. L. Quelques observations préliminaires sur le comportement de la patate douce dans le processus de production des chips. A paraître dans *Cameroon Journal of Biological and biochemical Sciences*. In press.
- 1999 TRYSTRAM G., TRELEA I.C., RAOULT-WACK A.L., DIAZ A., COURTOIS F. Indirect measurement and control of moisture content during dehydration performed by frying. A paraître dans *Drying Technology*. In press.

#### **IV. PUBLICATIONS IN REFEREED FRENCH JOURNALS OR TECHNICAL JOURNALS**

- 1998 GOTTRET V., HENRY G., DUFOUR D. Adoption et Impact de la transformation du manioc en amidon aigre en Colombie. *Cahiers de la Recherche et Développement* n° 44 - 1998, CIRAD, Montpellier
- 1998 VITRAC O., LISSE I., TRYSTRAM G., RAOULT-WACK A.L. Séchage par friture, transformations physiques et biochimiques. *Cahiers de l'AFSIA*, 16 : 27-35.
- 1998 RAOULT-WACK A.L., BRICAS N. Vers une évolution des démarches de recherche et de développement dans le secteur agro-alimentaire. Le cas de la friture. *Oléagineux Corps Gras Lipides*, vol. 5, n° 1, janv.-fév. 98, 47-51.
- 1998 GIROUX F., MAROUZE C. Conception locale d'équipements agricoles en agro-alimentaires à petite échelle. *La Lettre du réseau TPA* n° 15, mai 1998.

#### **V. MAIN COMMUNICATIONS AND LECTURES**

- 1998 HENRY G., PHILLIPS T. An overview of global cassava sector dynamics. Invited paper presented at the Ivth International Meeting of the Cassava Biotechnology Network, 2-7 Oct., 1998, Salvador-BA, Brazil (in press)
- 1998 HENRY G., GOTTRET V. Client-led Agro-industrial Action Development : The case of cassava starch in Cauca Valley, Colombia. In : *Proceedings of the AFSR&E Symposium*, 30 Nov. - 4 Dec., 1998, Pretoria, South Africa (in press).
- 1998 LANCON, TROUDE F., HENRY G., CRUZ J.F. Postharvest System Analysis : Lessons drawn from several CIRAD Experiences and Suggestions for further Methodological improvements. Paper presented at the 1998 GASGA Seminar, 3-5 June 1998, FAO, Rome.
- 1998 MESTRES C., DUFOUR D. Etude de quelques voies de valorisation alimentaire des produits amylacés tropicaux. In : *Le secteur artisanal des transformation agro-alimentaire au Bénin : situation actuelle et perspectives*. *Proceedings of an international seminar* hel in Cotonou, Bénin, 15-21 may 1998. 14 p. In press.
- 1998 BRICAS N., ATTAIE H. La consommation alimentaire des ignames, synthèse des connaissances et enjeux pour la recherche. In : Berthaud J., Bricas N. et Marchand J.-L. (Eds.). *L'igname, plante séculaire et culture d'avenir ; Actes du séminaire international Cirad, Inra, Orstom, Coraf, Montpellier, France, 3-6 juin 1997*. Montpellier, France, CIRAD-INRA-ORSTOM-CORAF, p. 21-30.

- 1998 ATEGBO E., BRICAS N., HOUNHOUIGAN J., MITCHIKPE E., NKPENU K.E., ORKWOR G., et al. Le développement de la filière cossettes d'igname pour l'approvisionnement des villes au Nigeria, Bénin et Togo. In : Berthaud J., Bricas N. et Marchand J.-L. (Eds.). L'igname, plante séculaire et culture d'avenir ; Actes du séminaire international Cirad-Inra-Orstom-Coraf, Montpellier, France, 3-6 juin 1997. Montpellier, France, CIRAD-INRA-ORSTOM-CORAF, p. 339-341.
- 1998 ATTAIE H., ZAKHIA-ROZIS N., BRICAS N. Etat des connaissances et de la recherche sur la transformation et les utilisations alimentaires de l'igname. In : Berthaud J., Bricas N. et Marchand J.-L. (Eds.). L'igname, plante séculaire et culture d'avenir ; Actes du séminaire international Cirad, Inra, Orstom, Coraf, Montpellier, France, 3-6 juin 1997. Montpellier, France, CIRAD-INRA-ORSTOM-CORAF, p. 275-284.
- 1998 HOUNHOUIGAN J., AKISSOE N., BRICAS N., VERNIER P. Diagnostic des systèmes techniques de transformation de l'igname en cossettes séchées au Bénin. In : Berthaud J., Bricas N. et Marchand J.-L. (Eds.). L'igname, plante séculaire et culture d'avenir ; Actes du séminaire international Cirad, Inra, Orstom, Coraf, Montpellier, France, 3-6 juin 1997. Montpellier, France, CIRAD-INRA-ORSTOM-CORAF, p. 349-351.
- 1998 ROUSSEL C., PINA M., GRAILLE J., HUC A., PERRIER E. Lipases-catalyzed lipophilization of proteins: case of soy proteins isolates. Workshop on Biopolymer Science, Montpellier ENSA.M 28-30 Sept. 1998.
- 1998 ZAKHIA N. Valorizacion de productos alimenticios tradicionales en la amazonia boliviana. Mejoramiento de los procesos de transformacion y calidad de los productos. In : La Agroindustria Rural en le Desarrollo Microregional Sostenible, Sept 9 - Oct 3 de 1998, CIAT, Cali, Colombia.
- 1998 ZAKHIA N. Valorizacion de productos alimenticios tradicionales en la amazonia boliviana. Mejoramiento de los procesos de transformacion y calidad de los productos. In : VI Jornada del PRODAR Andino - I seminario Nacional de Agroindustria Rural de Bolivia, 26-30 de octubre 1998, Sucre, Bolivia.
- 1998 DEUMIER F., BOHUON P., COLLIGNAN A. Meat curing (beef, deer, duck and turkey) by the dewatering-impregnation soaking (DIS) process. In : 44th International Congress of Meat Science and Technology, Barcelona, 30 Août - 4 septembre 1998, Vol. 1, 450-451.
- 1998 DEUMIER F., BOHUON P., COLLIGNAN A. Salaison de viandes (boeuf, daim, canard et dinde) à l'aide du procédé de déshydratation-imprégnation par immersion (DII). In : 7èmes Journées des Sciences du Muscle et Technologie de la viande, Rodez, 1er et 2 octobre 1998.
- 1998 COLLIGNAN A. Industrial development of salting and drying of fish fillets by continuous OT. In : Industrial application of osmotic deshydration/treatment of food. Project FAIR-CT96-1118. Bertinoro, Italy, 1 april 1998.
- 1998 COLLIGNAN A. Le salage séchage fumage en continu de produits carnés. Forum de l'innovation. I.P.A. 1998. 19-23 octobre. Porte de Versailles, Paris.
- 1998 COLLIGNAN A. Innovation dans le domaine de la transformation des produits animaux (poissons et viandes). Semaine de la science, 5-9 octobre. Saint-Denis La Réunion.
- 1998 GUILBERT S., REDL A., DE REGHT H., GONTARD N. Use of wheat gluten biopackaging for the controlled release of sorbic acid. In "New Developpements in Chemistry of Packaging" American Chemical Society, Dallas, 30 mars au 2 avril 1998.
- 1998 GONTARD N., REDL A. Glass transition of wheat gluten in its native and film forms. In "Worshop on Biopolymers Science - Food and Non Food Applications", Montpellier, France, 28, 29, 30 Septembre.

- 1998 VALENTE M., LOZANO Y. Physical characteristics modifications of lychee pericarp during storage under controlled conditions. IIIrd International Conference on Physics of agro & food products, Lublin, Poland, May 26-28th.
- 1998 E. LE ROUX, T. DOCO, P. SARNI-MANCHADO, C. LE GUERNEVE, Y. LOZANO, V. CHEYNIER. Polymeric and Oligomeric proanthocyanidins from pericarp of Litchi (*litchi sinensis* sonn). Polyphenol communication 98, XIXth International Conference on Polyphenols, Lille, France, September 1-4th.
- 1998 SPRANGLER M.I., RICARDO DA SILVA J.M., LEONARDO M.C., CAMEIRA DOS SANTOS P.J., SUN B.S., LE ROUX E., LOZANO Y. Characterisation of litchi (*litchi sinensis*, Sonn) Cultivars by analysis of the phenolic compounds in the pericarp. Polyphenol communication 98, XIXth International Conference on Polyphenols, Lille, France, 1-4 September.
- 1998 E. LE ROUX, SARNI-MANCHADO P., LOZANO Y., CHEYNIER V. Phenolic composition of litchi (*litchi sinensis*, Soon). Pericarp and mechanism of browning. Polyphenol Communication 98, XIXth International Conference on Polyphenols, Lille, France, 1-4 September.
- 1998 LOZANO Y. PANNUZZO S. Application of membrane separation technologies to tropical fruit processing. Some new developments in Developing Countries. Workshop "Membranes", Oct 21st, International Agro-Food Fair, IPA-SIAL, Paris, France.
- 1998 BRABET C., BRICAS N., HOUNHOUIGAN J., NAGO M. WACK A.L. Use of African Cassava Varieties for the production in Benin of Sour Starch, a Traditional Latin-American Baking Product. In: ISTRC-AB (Ed.) Seventh Triennial Symposium of the International Society for Tropical Root Crops - African Branch, Cotonou, Bénin, 11-17 octobre.
- 1998 COURTOIS F., TRYSTRAM G., LEMAIRE R., RAOULT-WACK A.L. Modelling of deep fat-frying of banana using a compartmental approach and boiling theory. In : Drying 98, ed. By A.MUJUMDAR, ZITI Editions, vol. B, 1452-1453.
- 1998 TRYSTRAM G., TRELEA J.C., RAOULT-WACK A.L., DIAZ A., COURTOIS F. Indirect measurement and control of moisture content during dehydration performed by frying. In : Drying 98, Ed. By A. MUJUMDAR, ZITI Editions, Thessaloniki, vol. B, 1460-1467.
- 1998 LUCAS T., CHOUROT J.M., BOHUON P., RAOULT-WACK A.L., FLICK D. Demarch for the modelling of coupled heat and mass transfer during immersion chilling and freezing. Meeting on "The preservation, of frozen food quality and safety throughout the distribution chain". Athens meeting, 26-28 March 1998, Plenary 4.
- 1998 VITRAC O., LISSE I., DIAZ A., TRYSTRAM G., RAOULT-WACK A.L. Séchage-cuisson par friture: transformations physiques des matériaux. X<sup>èmes</sup> rencontres scientifiques et technologiques des industries alimentaires : Agoral 98. Techniques et Documents Lavoisier, pp. 392-398.
- 1998 MAROUZE C., CHAPON C., GIRARD P., BOSSEY G., GIROUX F. La conception d'équipements agro-alimentaires dans les pays en développement. Comment analyser le besoin de façon pertinente pour aider les équipementiers à innover ? Application au cas du séchage pour le café et le cacao en Côte d'Ivoire. Congrès Bio-Décision, Montpellier, France, 23-25 février.
- 1998 DURY S., BIKOI A., BRICAS N. TCHANGO-TCHANGO J. La consommation et les critères de qualité du plantain à Douala et Yaoundé. In : Symposium International "les productions bananières ; un enjeu économique majeur pour la sécurité alimentaire", Douala, Cameroun, 10-14 novembre 1998.
- 1998 PIOCH D., LAURENT S., GRAILLE J. Surfactant-free palm olein/water emulsions stabilized by beta-cyclodextrin, on exotic emulsifier. Participation à la World Conference and Exhibition on Palm and Coconut Oils for the 21th Century, Février 1998. Bali.



- 1998 PIOCH D., CHIRAT N., LOZANO P., RYAN T., KNOTHE G., Precombustion chemistry and ignition delay of vegetable oils based biofuels ; Annual Conference of American Oil Chemists' Society 10-13 mai, 1998, Chicago.
- 1998 PIOCH D., LESCURE R., GRAILLE J., TANG THIN SUE. Fatty Ketones : A new route to oleochemicals. Annual Conference of American Oil Chemists' Society. 10-13 mai, 1998, Chicago.
- 1998 PIOCH D., VAITILINGOM G. Energy generation from vegetable oils.. 2<sup>d</sup> Meeting Partnership for Technological and Industrial development, CENBIO, 6-9 mai, Recife.
- 1998 BILLAUD F., ARCHAMBAULT D., MOULUT M.L., LOZANO P., PIOCH D. Upgrading of rapeseed oil : methyl oleate catalytic cracking, 2<sup>d</sup> Meeting of the European Section of the American Oil Chemists' Society, 1-4 octobre 1998, Cagliari, Italie.

## **VI. SUBMITTED FOR PUBLICATION**

- 1998 LAURENT S., PIOCH D. Effect of fatty phase composition on B cyclodextrin Emulsifying - Properties. Journal of Agricultural and Food Chemistry. Submitted.
- 1998 REDL A., CAILLET S., GUILBERT S., GONTARD N. Modelling of sorbic acid migration from a superficial thin layer film towards model food. Journal of Food Science. Submitted.
- 1998 NGUYEN THE C., CARLIN F., RENARD N., MANUCCI M.A., GONTARD N. Coating cooked sweet corn with zein and sorbic acid - effect on *Listeria monocytogenes*. International Journal of Food Science and Technology. Submitted.
- 1998 MUJICA H., DUCAMP M.N., REYNES M., GONTARD N. Ethylene permeability of wheat gluten film as a function of temperature and relative humidity. Polymer. Submitted.
- 1998 DE REGT H., ZAKHIA N., GUILBERT S., GONTARD N. Retention of sorbic acid in edible wheat gluten based films through microbiological studies. Journal of Agricultural and Food Chemistry. Submitted.
- 1998 VAN OIRSHOT Q., O'BRIEN G.M., DUFOUR D., LE SHARKAWY M, MESA E. The effect of pre-harvest pruning of cassava upon root deterioration and quality characteristics. Experimental Botany. Submitted.
- 1998 BOHUON P., RAOULT-WACK A.L., LE MAGUER M. Activity coefficient prediction of NaCl-Sucrose-Water from 283.1 to 303.1 K. Submitted for publication in Journal of Chemical Engineering data.
- 1998 BOHUON P., COLLIGNAN A., LE MAGUER M., RAOULT-WACK A.L. Assessment of cross mass transfer at the solid/liquid interface in soaking processes. Submitted for publication in Journal of Food Engineering.
- 1998 DE VERDELHAN T., COLLIGNAN A., RAOULT-WACK A.L. Deep-fat frying of fish at atmosphere pressure. Submitted for publication in Agricultural Engineering Journal.
- 1998 IGBEKA J.C., COLLIGNAN A., RAOULT-WACK A.L. Osmotic dehydration of okra (*Abelmoschus esculentus*): a qualitative assessment. Submitted for publication in Postharvest Biology and Technology.
- 1998 RAOULT-WACK A.L., ROUZIÈRE A., NOEL J.M. An original application of deep-fat frying : hot oil immersion drying of water-rich oily products prior to oil extraction. Submitted for publication in "Deep-fat-Frying", Ed. M. Blumenthal and J. Pokorny.

- 1998 VAN OIRSHOT Q., O'BRIEN G. M., DUFOUR D., EL SHARKAWI M., MESA E. The effect of pre-harvest pruning of cassava upon root deterioration and quality characteristics. *Experimental Botany*. Submitted.
- 1998 VILLENEUVE P., MUDERWHA J.M., GRAILLE J., HASS M.J. Customizing lipases for biocatalysis : a survey of chemical, physical and molecular biological approaches. Submitted for *Journal of Molecular Catalysis*.
- 1998 CHAULIAC M., BRICAS N., AMOUSSA W., ATEGBO E., ZOHOUN I. A food strategy to improve nutritional status of the urban poor in developing countries. Submitted for publication in "*American Journal of Clinical Nutrition*".
- 1999 ROUSSEL-PHILIPPE C., PINA M., GRAILLE J. Chemical lipophilisation of different proteins. Submitted for *Journal of Agricultural and Food Chemistry*.

## **VII. POUR MÉMOIRE : PUBLICATIONS EN PRÉPARATION**

- 1998 BOHUON P., COLLIGNAN A., RIOS G.M. , RAOULT-WACK A.L., Mass transport phenomena during dewatering and impregnation soaking processes. Model gel and animal foodstuffs (Black cod, *Salmo salar*). In preparation for *Journal of Food Science*.
- 1998 CARNIZIO G., REYNES M., RAOULT-WACK A.L. Deep-fat-frying : Influence of maturity stage and variety on banana chips quality. In preparation.
- 1998 GIROUX F., CUQ B., GUILBERT S., RAOULT-WACK A.L., TRYSTRAM G. Dynamic modelling of water and solute transfer during dewatering and impregnation soaking of fruit. Part 1. Processing under constant conditions.
- 1998 GIROUX F., CUQ B., GUILBERT S., RAOULT-WACK A.L., TRYSTRAM G. Dynamic modelling of water and solute transfer during dewatering and impregnation soaking of fruit. Part 2. Processing under variable conditions.
- 1998 VITRAC O., DUFOUR D., RAOULT-WACK A.L. Friture du manioc : influence de la variété sur le comportement du produit en friture.
- 1998 VITRAC O., DUFOUR D., RAOULT-WACK A.L. Friture du manioc : influence des paramètres du procédé sur la qualité des chips de manioc.
- 1998 LUCAS T., FRANCOIS J., BOHUON P., RAOULT-WACK A.L. Factors influencing impregnation during long term freezing immersion.
- 1998 LUCAS T., CHOURET J.M., GUILPART J., RAOULT-WACK A.L., BENAÏM R. Réfrigération-congélation par immersion dans un liquide aqueux réfrigérant : étude des transports couplés de chaleur et de matière au sein d'un élément modèle (lit de billes de verre). In preparation for *International Journal of Food Science and Technology*.
- 1998 LUCAS T., FLICK D., RAOULT-WACK A.L. Modeling and control of solute impregnation during immersion freezing.
- 1998 CARO Y. , VILLENEUVE P., PINA M., REYNES M., GRAILLE J. Mise en évidence d'activités lipasiques d'extraits végétaux bruts. *J. Am. Oil Chem. Soc.*
- 1998 PINA M., GRAILLE J. Mise au point d'une microméthode pour analyser la structure glycéridique des triglycérides sériques. *Lipids*.



- 1998 NOEL J.M., BAREA B., PINA M., GRAILLE J. Une huile de palme de Colombie ; un équivalent tropical de l'huile d'olive. Oléagineux Corps Gras Lipides.
- 1998 NOEL J.M., BAREAB., PINA M., GRAILLE J. Raffinage physique de l'huile de DRUPALM sans présence de mousse.Plantation Research an development.
- 1998 OZENNE C., PINA M., GRAILLE J. Modification de la matière grasse laitière anhydre biocatalysées par les latex bruts végétaux. Journal of Food Science.
- 1998 ROUSSEL-PHILIPPE C., PINA M., GRAILLE J. Etude comparée de la lipophylisation chimique et biocatalysée d'une protéine modèle : l'albumine sérique bovine. Journal of Agricultural and Food Chemistry.
- 1998 DUCRET A., GUYOT B., PINA M., GRAILLE J. Synthèses d'antioxydants modèles : hydroxytyrosol et esters ferruliques.
- 1998 VILLENEUVE P., GUYOT B., PINA M., GRAILLE J., GRUNING B., WEITEMEYER C., Synthèses biocatalysées d'esters gras de sucro-acides. Fett Lipids.
- 1998 GRAILLE J. Altération des corps gras : synthèse d'un modèle d'oxydimère triglycéridiques. Chem. and Phys. Lipids.
- 1998 ROUSSEL-PHILIPPE C., REDL A., MOREL M.H., PINA M., GUILBERTS S., GRAILLE J. Modifications chimiques du gluten de blé et propriétés des films à base de gluten de blé modifié. Journal of Agricultural and Food Chemistry.
- 1999 VALENTE M., BANZOUZI J.T., PIETRI E. Evaluation non destructive de la fermeté de la mangue par la technique acoustique impulsione. En cours de rédaction pour la revue "Fruits".
- 1999 LAURENT S., SERPELLONI M., PIOCH D. A study of B cyclodextrin stabilized paraffin oil/water emulsions. Journal of Cosmetic Science, accepté en décembre 1998.
- 1999 PIOCH D., LARGUEZE C., GRAILLE J., AJANA H. ROUZIERE J. Towards an efficient membrane based vegetable oils refininf process. Industrial Crops and Products.

### LES THESES SOUTENUES EN 1998

Nom et Prénom	Statut actuel	Directeur de thèse / recherche	Université de rattachement	Date soutenance	mention	Sujet
LUCAS Tiphaine	Chercheur CEMAGREF	Ben Aim R. Wack A.L.	ENGREF	07/10/1998	très honorable avec les félicitations du jury	Caractérisation expérimentale et modélisation des transferts de matière et de chaleur en RCPI
ROUSSEL Coralie	CDD CIRAD	E. Borredon J. Graille	INP Toulouse	20/04/1998	très honorable	Etude de différents procédés de lipophilisation des protéines : applications aux protéines de soja et de gluten de blé
CHEYNS Emmanuelle	CDD CIRAD	Requier Desjardin N. Bricas	UM2-ENSA.M	18/11/1998	très honorable avec les félicitations du jury	Identification et construction sociale de la qualité de produits agro-alimentaires dans un contexte d'urbanisation au Burkina
VALDEZ Aurora	Chercheur Uni. Chihuahua	J.J. Bimbenet F. Giroux	ENSIA	13/03/98	très honorable	Etude du recyclage des solutions concentrées en déshydratation-imprégnation par immersion. Application au cas du traitement de pommes dans une solutions de saccharose.
SARHY-MANGIN BAGNON Valérie	Chercheur UAM Mexico	B. Marin P. Lozano	Montpellier II	19/11/1998	très honorable avec les félicitations du jury	Production de 6 pentyl-pyrone par T. Harzanium cultivé sur support solide

### LES HABILITATIONS A DIRIGER DES RECHERCHES SOUTENUES EN 1998

Nom et Prénom	Statut actuel	Université de rattachement	Date soutenance	Sujet
WACK Anne-Lucie	Détachée Minagri au CIRAD	UM 2	01/07/98	Transferts de matière croisés dans les opérations unitaires de traitement en phase liquide de matériaux biologiques solides divisés
GONTARD Nathalie	Mise à disposition au CIRAD	UM 2	14/12/98	Science des matériaux appliquée aux polymères agro-alimentaires : étude et mise au point d'emballages et d'enrobages biodégradables et/ou comestibles

# LISTES DES STAGES ENCADRÉS PAR LE PAA EN 1998

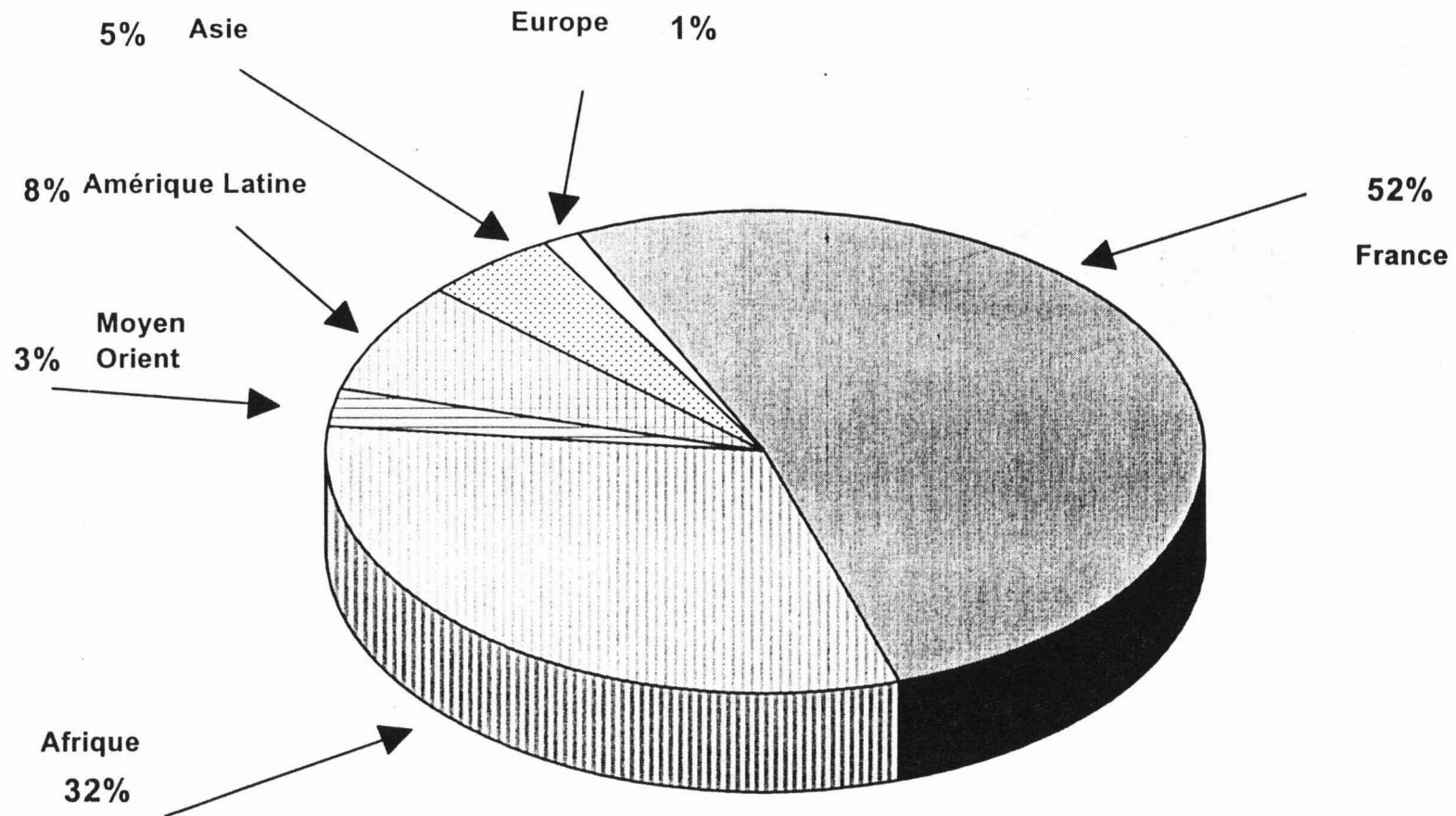
Nom du stagiaire	Prénom	Date du stage		Thème du stage	Maître de stage
		Début	fin		
GIAMBRONE	David	01/01/1998	30/04/1998	Techniques séparatives. Concentration fruits tropicaux	LOZANO
ROUSSEL	Coralie	01/01/1998	30/09/1998	Lipophilisation de différentes protéines avec acides gras et condensations en carbone + mise au point d'un dosage fiable à la réaction	GRAILLE
BURHANUDDIN	Mr	01/01/1998	20/02/1998	Bioproduction de molécules amphiphiles	GRAILLE
PRASAD	Janardan	01/01/1998	30/01/1998	Conception des équipements	MAROUZE
SINGH	Gyanendra	01/01/1998	30/01/1998	Méthodes de conception d'équipements	MAROUZE
HUSSENET	Aude	01/01/1998	15/02/1998	Un nouveau procédé de salage/séchage/fumage et marinage appliqué au traitement de poissons du lagon d'ouvéa	COLLIGNAN
REGNAULT	Stéphanie	01/01/1998	13/02/1998	Stabilisation d'herbes aromatiques par DII	MOUQUET
ANIHOUVI	Victor	01/01/1998	30/04/1998	Traitement thermique des produits carnés par friture	BOHUON
VALDEZ FRAGOSO	Aurora	01/01/1998	30/04/1998	Génie des procédés agro-alimentaires	GIROUX
EL OUADRHIRI	Youssef	01/01/1998	31/01/1998	Suivi d'essais de séchage industriel	MEOT
LONGERINAS	Estelle	01/01/1998	13/02/1998	Laits végétaux	MONTET
VITRAC	Olivier	01/01/1998	01/12/1999	Caractérisation expérimentale et modélisation des transferts et transformations en cours de friture	WACK
MESQUITA CARNEIRO	Maria De Jesus	01/01/1998	26/08/1998	Génie agro alimentaire	WACK
DEUMIER	François	01/01/1998	31/12/1998	Contribution à la compréhension des mécanismes physiques, biochimiques, microbiologiques lors de la salaison du magret de canard	COLLIGNAN
FERRADA	Marcelo	05/01/1998	13/01/1998	Expériences complémentaires sur les cinétiques de refroidissement du poisson par immersion	GOLI
SY	Ousmane	15/01/1998	14/03/1998	Méthodes de déshydratation et imprégnation par immersion	WACK
KRESPINE	Virginie	01/02/1998	30/09/1998	devt de boisson amyliacée stabilisée par lactofermentat	LOISEAU
OTALORA	Cyril	02/02/1998	06/02/1998	Analyse Labo	WACK
NDAW	Bassirou	12/02/1998	15/09/1998	intégration de la maintenance dans la conception	MAROUZE
BANZOZI	Jean Théophile	16/02/1998	31/07/1998	détermination de la maturité des fruits par la méthode acoustique	VALENTE
BENGMAH	Samira	09/03/1998	31/07/1998	Qualité des fruits	VALENTE
PILLON	Xavier	09/03/1998	09/08/1998	Etude d'un procédé de raffinage d'huiles par microfiltration	PIOCH
BACHAIN	Philippe	15/03/1998	30/06/1998	Esters de sucre	GRAILLE
VAILLANT	Soline	16/03/1998	17/09/1998	mise au point d'un procédé de déshydratation imprégnation d'herbe aromatiques	MEOT
BRANELLEC	Céline	16/03/1998	11/09/1998	identification par RMN/IRM des transformations physiques au cours d'une friture	BOHUON
RAKSHIT	Sudip	23/03/1998	24/05/1998	Utilisation technique membranaire - Valorisation huile poisson	PIOCH
LISSE	Laetitia	23/03/1998	01/05/1998	Actualisation des bilans alimentaires Afrique	BRICAS
RULA	Alexandra	30/03/1998	19/06/1998	Contrôle qualité fruits	VALENTE
GAY	Fabrice	30/03/1998	31/08/1998	Etude technico-économique dun procédé de découpe et séparation de végétaux par voie humide	MEOT
LAMPIN	Sébastien	30/03/1998	28/08/1998	Valorisation des huiles de poisson par microfiltration	PIOCH
VELLUTINI	Luc	30/03/1998	31/07/1998	Chimie option moléculaire	PIOCH
BETSCH	Jurgen	01/04/1998	30/09/1998	Arômes - Fruits tropicaux	LOZANO
RONIN-MORTREUX	Marie	01/04/1998	31/08/1998	Valorisation lipochimique. Fonctionnalisation des chaînes hydrocarbonées	PIOCH
SOUSA GOMES	João Baptista	01/04/1998	30/04/1998	préparation à l'analyse diagnostic des filières et marché du poisson transformé au Sénégal	BRICAS
CHEVALLIER	Frédérique	01/04/1998	12/06/1998	Participation mise au point d'un procédé de production d'herbes aromatiques à l'humidité intermédiaire	MEOT
SABER	Nidal	01/04/1998	30/09/1998	Application du procédé de DII sous vide à la viande de volaille	COLLIGNAN
LAFON	Celine	01/04/1998	30/09/1998	Mise au point méthode stéréorépartition des AG sur TG seriques humaines	GRAILLE



Nom du stagiaire	Prénom	Date du stage		Thème du stage	Maître de stage
		Début	fin		
FRANÇOIS-ELIE	Claudine	06/04/1998	12/06/1998	Stabilité de la couleur de boissons au Bissap	LOZANO
CARO	Yanis	06/04/1998	30/09/1998	Valorisation de la papaine et de la broméline	GRAILLE
THEROND	Julien	06/04/1998	12/06/1998	Synthèse d'esters, en tant qu'additifs dans les carburants	PIOCH
DECLOQUEMENT	Cécile	14/04/1998	19/06/1998	Lipophilisation des protéines	PINA
KAMBOU-NABALAMA	Denise	14/04/1998	30/09/1998	élaboration d'abaque pour salé/séché par DID de filets de saumon	COLLIGNAN
PARENTEAU	David	14/04/1998	20/06/1998	Participation à la mise au point d'un procédé de production d'herbes aromatiques à l'humidité intermédiaire (confidentiel)	MEOT
CATTIER	Sylvain	20/04/1998	26/06/1998	conception et réalisation d'un module de liaison RS232	MEOT
SANGARE	Mamadou	23/04/1998	05/06/1998	gazogenes	VAITILINGOM
BOURANE	Ludex	01/05/1998	10/09/1998	Aplication des techniques séparatives membranaires aux fruits tropicaux (mangue, banane,...)	LOZANO
EL HASSAN	Abdelellah	01/05/1998	31/08/1998	Economie du développement agricole agro-alimentaire	VAITILINGOM
DOUMEIZEL	Eric	02/05/1998	20/09/1998	Etude économique de la filière "banane" à la Réunion	COLLIGNAN
ARCILA	Mauricio	01/06/1998	30/01/1999	Conception d'un outil de récolte du café	MAROUZE
FEDRIGO	Patricia	01/06/1998	30/09/1998	Diagnostic du système agro-alimentaire de l'East-London (R.A.S.)	BRICAS
HAFIDI	Abdellatif	03/06/1998	30/09/1998	Raffinage par filtration	PIOCH
RENAUX	Severine	04/06/1998	28/08/1998	Refroidissement du poisson (PESCA)	GOLI
BAKA N'GUESSAN	Alain	10/06/1998	25/09/1998	Conception, construction et expérimentation d'un séchoir pour produits roulés	MEOT
MBAYE	Cheikh	11/06/1998	09/07/1998	Opération unitaire de friture	WACK
CASTILLO	Monica	15/06/1998	15/01/1999	Régénération des solutions concentrées de DII	MEOT
HERREYRE	Karine	01/07/1998	31/08/1998	Analyses chimiques	PIOMBO
CAZELLE	Elodie	01/07/1998	30/06/1999	L'huile de palme	PIOCH
REDON	Emma	01/07/1998	31/07/1998	Analyses chimiques	PIOMBO
BOURDEL	Geoffroy	01/07/1998	24/07/1998	Participation à la mise au point d'herbes aromatiques à humidité intermédiaire	MEOT
NKUNDA	Dominique	01/07/1998	15/09/1998	Appui au travail sur pilote D11 + évaporation sous vide	MEOT
MONTAGNE	Julien	01/07/1998	31/07/1998	Application du vide pulsé à la DII de fruits	MEOT
BRUNET-MANQUAT	Nicolas	01/07/1998	15/08/1998	Application des techniques séparatives membranaires aux fruits tropicaux	LOZANO
NIDEGGER	Muriel	06/07/1998	27/11/1998	Perméabilité et sorption des gaz CO2 O2 dans des filins biodégradables protéiques hydrophyles	GONTARD
ZAMO KANA	Esther	24/07/1998	20/09/1998	Participation aux activités G.P.E.	MEOT
TAYEH	Izzeddeen	01/08/1998	30/01/1999	Etude de la fermentation lactique de boissons amylacées	LOISEAU
COUTELLIER	Julie	01/09/1998	12/02/1999	Conservation du poisson?CONTRAT PESCA	GOLI
SALVADORI	Viviana	21/09/1998	20/10/1998	Congélation du poisson	GOLI
CAPEL	Damien	21/09/1998	09/10/1998	Microbiologie	LOISEAU
MITCHIKPE	Evariste	02/10/1998	30/10/1998	Analyse des enquêtes de consommation du projet ALISA	CHEYNS
NDOYE	Fatou	02/10/1998	30/10/1998	Analyse des enquêtes de consommation du projet ALISA	CHEYNS
AGBODOLI	Justin	05/10/1998	31/01/1999	Amélioration de la qualité des cossettes d'igname par l'introduction d'une pré-découpe des tubercules dans le procédé	BRICAS
NDIAYE	Augustin	26/10/1998	31/01/1999	Valorisation de l'hibiscus Sabdariffa	LOZANO
KANE	Amadou	01/11/1998	31/01/1999	Etude de la qualité biochimique des variétés de riz	PIOMBO

Nom du stagiaire	Prénom	Date du stage		Thème du stage	Maitre de stage
		Début	fin		
BATIONO	Frédéric	02/11/1998	27/11/1998	Methode de conception d'equipements + cao	MAROUZE
TRAORE	Zoumani	02/11/1998	27/11/1998	methode de conception d'equipements + cao	MAROUZE
SOSDRI	Neamprem	08/11/1998	30/11/1998	Conservation des fruits tropicaux sous atmosphère modifiée	LOZANO
MORENO	Martin	08/11/1998	05/12/1998	methode de conception d'equipementds	MAROUZE
HABIBUNNISA		08/11/1998	30/11/1998	Conservation des fruits tropicaux sous atmosphère modifiée	LOZANO
MITCHIKPE	Evariste	30/11/1998	12/12/1998	Analyse des enquêtes de consommation du projet ALISA	CHEYNS
BAKA N'GUESSAN	Alain	14/12/1998	29/01/1999	Conception, construction et expérimentation d'un séchoir pour produits roulés	MEOT

# origine des stagiaires accueillis au Programme Agro-Alimentaire





# PROGRAMME AGRO-ALIMENTAIRE : CONTRATS EN COURS EN 1998

## CONTRATS PILOTES PAR LE PAA

SITUATION AU : 29/12/98

TITRE BREF	RESP.	Début	Fin	Lieu	Organismes financiers	Observations
Friture par micro-ondes/ARMC	J. Graille	02/03/98	01/05/98	F	ARMC + Anvar F.C	
Hydrophobation d'hydrolysats enzymatiques protéines végétales	J. Graille	04/06/98	05/04/99	F	ONIDOL	Avenants 1 et 2
Boissons végétales à base de céréales ULICE	G. Loiseau		2 ans	F	DGAL/Aliment Demain	avec CA*
Expertise sur 5 projets africains manioc	G. Henry	01/12/97	31/01/98	F	CFC	
Inventaire des utilisations du manioc	G. Henry	15/12/97	31/01/98	F	FAO	
PESCA	T. Goli	01/04/97	31/03/98	F	Région LR + FEDER	
Eridania Beghin Say	JM Méot	04/03/96	04/03/97	F	Eridania Beghin Say	
Eridania Beghin Say	JM Méot	03/04/97	03/04/98	F	Eridania Beghin Say	avenant 1
Eridania Beghin Say	JM Méot	03/04/98	30/10/98	F	Eridania Beghin Say	avenant 2
Eridania Beghin Say	JM Méot	11/05/98	11/07/98	F	Eridania Beghin Say	avenant 3
Solutions énergétiques pour usages de puissance au Mali	G. Vaitilingom	01/03/98	01/04/98	F+ Mali	APEX (EDF+ADEME)	
Equipements de mesure pour émissions de bus	G. Vaitilingom	12/02/98	20/02/98	F	ADEME	
FAIR BIOMASSE	G. Vaitilingom	01/01/96	31/12/99	F	UE/FAIR	
Séchage du riz MESR	J.M. Méot	1997	1998	F	MESR	
Poisson Tanzanie GERES	T. Goli	1998	1998	Tanzanie	GERES	
Tubercules Nouvelle Calédonie	D. Dufour	1998	1998	Nvle Calédo	Province des Iles	
PRI noix du Brésil	T. Goli		31/12/98	F+ Brésil	MAE	
Lipophilisation des acides uroniques	J. Graille	07/05/98	06/11/98	F	GOLDSCHMIDT	
BEL	J. Graille	07/05/98	06/11/98	F	BEL	
Prestations en marinage anchois BELMONTE	A. Collignan	08/04/98	08/04/99	F	BELMONTE	
Vente equipt et accompagnement BELMONTE	A. Collignan	26/05/98	25/01/99	F	BELMONTE	
Cession de licence marinage par DID à BELMONTE	A. Collignan	20/05/98	20/05/18	F	BELMONTE	Royalties
Cession de licence salage-séchage par DID à ARBOR	A. Collignan	16/04/97	16/04/17	F	ARBOR	Royalties
Divers ARBOR - ESSENCIAS DEL MAR -	T. Goli	1998	1998	F + Espagne	ARBOR-ESSENCIAS	
Oignons TISSOURA	JC Dumas	31/03/98	31/12/98	Maroc	Sans objet	
ENSIA-Begin Say	JM Méot	11/05/98	11/07/98	F	Eridiana Begin Say	S/trait par ENSIA
Diffusion régionale cossettes d'igname	N. Bricas	01/04/98	01/04/00	Afrique	Mini Coop	avec CA*
Etude des marchés potentiels du manioc	G. Henry	15/05/98	15/07/98	F	IFAD-IDRC	
Agroalimentaire Côte Sud	D. Griffon	01/05/98		Brésil	MAE	
PRI Danone / boissons végétales	G. Loiseau	01/10/98	01/10/99	F+ Brésil	MAE	avec CA*
Pégase Développement	N. Bricas	01/10/98	28/02/99	F	BE Pégase	
Huile de poisson DGAL	D. Pioch	01/11/98	31/10/00	F	DGAL/Aliment Demain	
Biocarburants régionaux Languedoc-Roussillon	G. Vaitilingom	01/10/98	01/10/99	F	Cuma Belpech	
Post-recolte et consommation d'ignames	J.M. Méot	01/12/98	30/11/02	Afrique	UE INCODC	avec CA*
Essais vinasse Arthenay	G. Vaitilingom	01/12/98	31/12/98	F	Sucrene d'Arthenay	
Consultance DANONE	J. Graille	20/12/98	20/06/00	F	DANONE	
Expertise PORIM	D. Pioch	01/12/98	20/12/98	Malaisie	MAE	
Prestations SAUPIQUET	T. Goli	15/12/98	15/01/99	F	SAUPIQUET	
Patates douces CIP	D. Dufour	17/09/98	31/01/99	F+ Pérou	CIP + CIRAD	avec CA*

\* contrats obtenus par PAA, pour lesquels PAA a sollicité des prestations auprès de CIRAD-CA

## PROGRAMME AGRO-ALIMENTAIRE : CONTRATS EN COURS EN 1998

### PRESTATIONS DE SERVICE DEMANDÉES AU PAA, PAR LES AUTRES DÉPARTEMENTS

Département	Projets réalisés ou en cours
FLHOR	<ul style="list-style-type: none"> <li>- Régimes de bananes Martinique</li> <li>- UE litchis</li> <li>- UE mangues</li> <li>- Prestations diverses atelier de mécanique</li> <li>- Analyses de laboratoire</li> <li>- ATP Approvisionnement des villes</li> </ul>
FORÊT	<ul style="list-style-type: none"> <li>- Accueil de D. Guibal au labo Métrologie</li> <li>- Prestations diverses BE et atelier de mécanique</li> <li>- Analyses de laboratoire</li> </ul>
CA	<ul style="list-style-type: none"> <li>- PRI "amidon aigre" Valpiform</li> <li>- Prestations diverses Bureau d'études et atelier</li> <li>- Analyses de laboratoire</li> </ul>
CP	<ul style="list-style-type: none"> <li>- projet "Chaîne ramifiée" / ADEME</li> <li>- projet ADEME - Crific</li> <li>- Prestations diverses Bureau d'études et atelier</li> <li>- Analyses de laboratoire</li> <li>- projet Amylum films</li> </ul>
EMVT	<ul style="list-style-type: none"> <li>- Analyses de laboratoire</li> </ul>
DG/Formation	<ul style="list-style-type: none"> <li>- Stagiaires indonésiens / FPR (PAA-SMANA)</li> </ul>
TERA	<ul style="list-style-type: none"> <li>- projet ADEME / Combustion vinasse</li> <li>- projet Tracteur FIAT / Cuma</li> <li>- projet Emballages fruits tropicaux / Min.DOM</li> <li>- projet Bourre de coco / Sangam</li> <li>- projet INCO - Alisa</li> <li>- projet MAE Afrique du Sud - Umthiza</li> </ul>

Pour mémoire : Participation du PAA à des "Actions Thématiques Programmées" ou à des "Actions Incitatives" :

- ATP Méthodes de conception d'équipements (pilotée par PAA, dernière année)
- ATP Bioemballages (pilotée par PAA, clôturée en 1998)
- ATP Approvisionnement des villes (participation)
- ATP Approvisionnement en lait (participation)
- AI Observatoire de la consommation au Vietnam (pilotée par PAA)



# PROGRAMME AGRO-ALIMENTAIRE : CONTRATS EN COURS EN 1999

SITUATION AU : 21/01/99

TITRE BREF	RESP.	Début	Fin	Lieu	Organisme financier	Observations
Hydrophobation d'hydrolysats enzymatiques protéines végétales	J. Graille	04/06/98	05/07/99	F	ONIDOL	Avenants 1 et 2
Boissons végétales à base de céréales ULICE	G. Loiseau	05/12/97	05/12/99	F	DGAL/Aliment Demain	avec CA ***
Alimentation, savoir-faire et innovation AA (ALISA)	N. Bricas	01/01/98	31/10/99	Afrique	UE INCO CIRAD-TERA	PAA pour TERA**
PESCA	T. Goli	01/04/97	31/03/98	F	Région LR + FEDER	
UE Litchis	Y. Lozano	01/01/95	01/08/99	Chine+Thaï	UE	PAA pour FLHOR*
UE Mangues	Y. Lozano	01/01/94	01/02/99	Inde+ Thaï	UE	PAA pour FLHOR*
FAIR Biomasse	G. Vaitilingom	01/01/96	31/12/99	F	UE/FAIR	
Prestations en marinage anchois BELMONTE	A. Collignan	08/04/98	08/04/99	F	BELMONTE	
Vente équipt et accompagnement BELMONTE	A. Collignan	26/05/98	25/01/99	F	BELMONTE	
Cession de licence salage-séchage par DID à ARBOR	A. Collignan	16/04/97	16/04/17	F	ARBOR	Royalties
Cession de licence marinage par DID à BELMONTE	A. Collignan	20/05/98	20/05/18	F	BELMONTE	Royalties
Diffusion régionale cossettes d'igname (Coop Igname 2)	N. Bricas	01/04/98	01/04/00	Afrique	Mini Coop	avec CA ***
Post-récolte et consommation d'ignames	J.M. Méot	01/12/98	30/11/02	Afrique	UE INCODC	avec CA ***
Agroalimentaire Côte Sud	D. Griffon	01/05/98		Brésil	MAE	
PRI Danone / boissons végétales	G. Loiseau	01/10/98	01/10/99	F+ Brésil	MAE	avec CA ***
Pégase Développement	N. Bricas	01/10/98	28/02/99	F	BE Pégase	
Huiles de poissons DGAL"Aliment Demain" (INPL-Ledun-TIA)	D. Pioch	01/11/98	31/10/00	F	DGAL/Aliment Demain	
Biocarburants régionaux Languedoc-Roussillon	G. Vaitilingom	01/10/98	01/10/99	F	Cuma Belpech	
Consultance DANONE / LU	J. Graille	20/12/98	20/06/00	F	DANONE	
DIAMED	T. Goli	01/02/99	31/01/00	F	DIAMED	
Prestations SAUPIQUET	T. Goli	15/12/98	15/01/99	F	SAUPIQUET	
Chaine fonctionnalisée AGRICE (Onidol-IFP-Nyco)	D. Pioch	29/12/98	29/03/00	F	ADEME/Agrice 98	
PME agroalimentaires	N. Bricas	01/01/99	30/06/02	Afrique	UE	avec GRET et IRD
ACTEI / SANGAM - Tikobo	Rivier	04/01/99	31/12/99	F	ACTEI	
Démarrage à froid / ester huile de friture	G. Vaitilingom	07/12/98	06/09/99	F	ADEME	

\* contrats FLHOR réalisés par PAA

\*\* contrat piloté par TERA pour lequel PAA est sollicité

\*\*\* contrats pilotés par PAA, pour lesquels PAA sollicite des prestations auprès de CIRAD-CA

Activités 1999.xls

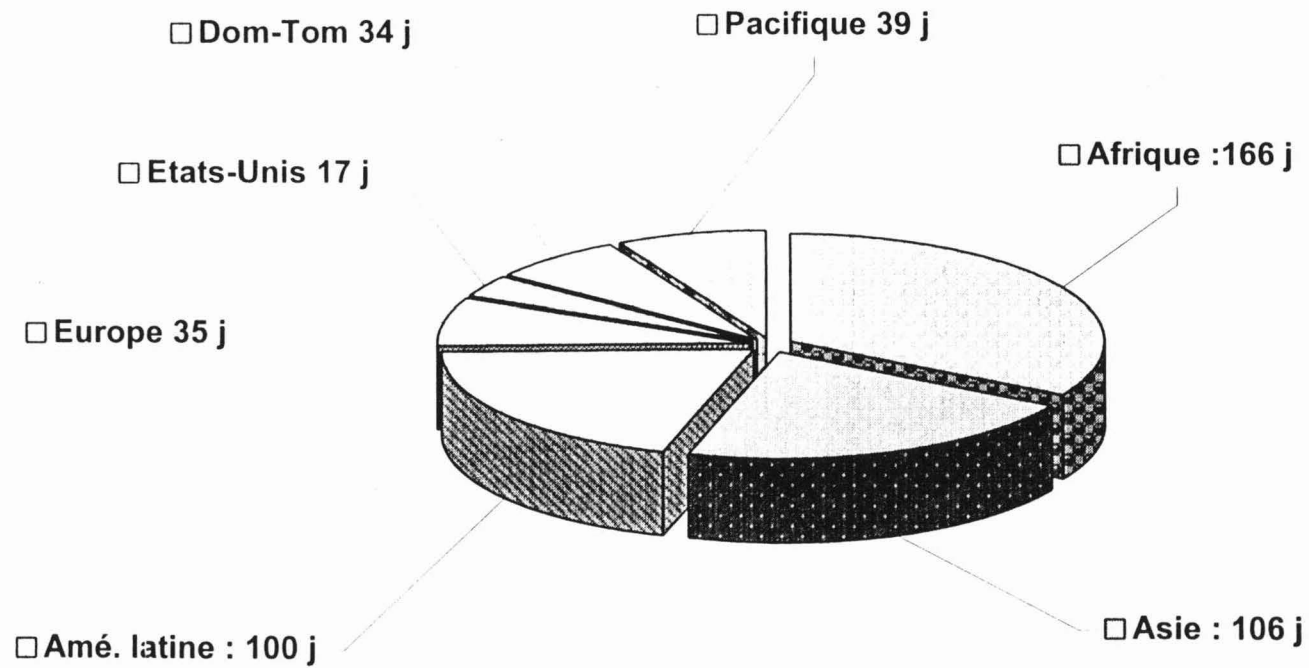
# PROGRAMME AGRO-ALIMENTAIRE : LES MISSIONS A L'ETRANGER RÉALISÉES EN 1998

Nom	Pays visité	Dates		Nbre/j	Objet de la mission
		début	fin		
BRICAS	Bénin	02/06	11/06	9	1ère réunion de coordination projet "la valo. de l'igname pour les marchés urbains ; phase 2 : diffusion régionale du système cossette".
BRICAS	Cameroun	23/02	09/03	14	1 - Suivi des travaux de l'ATP 95/41 "approvisionnement vivrier des villes africaines". 2 - Projet igname au Cameroun. 3 - Suivi T. FERRE IRAD-Garoua.
BRICAS	Sénégal	20/04	06/12	8	Mise en oeuvre de la collaboration SNR3A/ITA-CIRAD dans le domaine agro-alimentaire.
BRICAS	Vietnam	06/12	13/12	7	Participation à l'atelier sur la surveillance alimentaire et nutritionnelle
CHEYNS	Afrique du Sud	14/06	23/06	9	Lancement d'une étude sur les styles alimentaires et divers contacts - Projet AMATAI.A
CHEYNS	Bénin	02/06	11/06	9	Première réunion de coordination du projet "valo. de l'igname pour les marchés urbains phase 2 : diffusion régionale du système cossette".
CHEYNS	Bénin,BF,Sng	15/02	09/03	22	Suivi du projet AI ISA (Bénin, Burkina Faso, Sénégal)et démarrage du Projet Valo. de l'igname Phase 2
CHEYNS	Burkina-Faso	30/03	12/04	13	Séminaire AI ISA (INCO-DC) ; Séminaire AVAI. (Mincoop ; Valo. des savoir-faire locaux).
COLLIGNAN	Italie	31/03	03/04	3	Participation à l'action concertée de la Communauté Européenne sur la Déshydratation Osmotique.
COLLIGNAN	Réunion	10/02	21/02	11	Définition des conditions liées à son expatriation ; suivi et renforcement des activités AA à la Réunion
COLLIGNAN	Réunion	29/06	11/07	12	Préparation de la prise de fonction au 01.09.98 ; suivi de l'opération transformation des produits carnés.
COLLIGNAN	Mayotte	09/12	14/12	6	Participation à la semaine de la Science à Mayotte. Communication "Innovation dans le domaine de la transfo. des produits animaux.
DUMAS	Maroc	23/09	27/09	5	Elaboration projet amélioration filière oignon
GALLET	Philippine	02/11	11/11	9	Installation de matériels et formation au CIRAD-FILHIO
GIROUX	Sénégal	22/06	11/07	20	Recherche sur les méthodes de conception d'équipements dans le cadre de l'ATP Cirad
GIROUX	Colombie	21/10	28/10	8	Appui à la recherche en conception d'équipements
GOLI	Portugal	10/09	13/09	3	Participation au séminaire de l'action concertée européenne sur la chaîne du froid
GRAILLE	Etats-Unis	09/05	17/05	8	Congrès de l'American Oil Chemists' Society (AOCS), Chicago ; reprise des contacts avec Dpt of Food Science Univ.Massachusetts
GRAILLE	Réunion	22/07	27/07	5	Jury de thèse et visite du CIRAD à Saint Denis la Bretagne.
GRAILLE	Allemagne	05/11	05/11	1	Réunion concernant la fin du contrat Goldschmidt 3
GRAILLE	Italie	11/11	12/11	2	Rencontre avec SOMMER
HENRY	Brs,Colombie,Uru	15/03	07/04	23	1ère rencontre avec partenaires Cône Sud ; préparation affectation Brésil, participation réunion CBN et global cassava strategy
HENRY	Royaume-Uni	04/01	07/01	3	Consultation et collaboration du projet PROAMYL
LIENNARD	Nelle-Calédonie	08/02	28/02	20	Formation et maintenance sur huilerie à Ouvéa. Nouvelle Calédonie. Mission d'appui.
LOISEAU	Thaïlande	28/11	09/12	10	Collaboration recherche avec bioprocess Technology Program de l'AIT + master international
LOZANO	Belgique	02/06	04/06	2	Rencontre avec le Resp. Scient. Européen (Mme FERRAS) de projets U.E. LITCHI, coordonné par CIRAD.
LOZANO	Inde	09/05	20/05	11	Coordination projet E.U. n° TS3-CT93-0209. Transfo mangue. Appui scient. et techn. pour le partenaire CFTRI - Mysore.
LOZANO P.	Angleterre	22/07	24/07	3	Groupe de travail "Science of Biomass Pyrolysis" organisé par Bio-energy research group - Aston University, Birmingham
LOZANO P.	Italie	01/10	04/10	4	Communication 2nd Meeting of the European Section AOCS.
MAROUZE	Inde	30/03	10/04	11	Appui méthodologique aux projets de conception.
MAROUZE	Sénégal	03/05	16/05	13	Appui méthodologique à trois projets de conception menés par l'ESP et formation méthodes de conception
MAROUZE	Sénégal	12/10	23/10	12	Poursuite des travaux sur les méthodes de conception d'équipements
MAROUZE	Inde	01/12	11/12	11	Appui méthodologique
MAROUZE	Sénégal	15/12	23/12	9	Poursuite des travaux sur les méthodes de conception d'équipements
MONTET	Chine	16/06	18/06	3	Salon "The first international wine and spirits exhibition for Asia-Pacific", Hong-King, Chine.
MONTET	Chine	07/09	10/09	4	3rd Asia-Pacific Chitin and Chitosan Symposium à Keelung, Taiwan, Chine.
MONTET	Philippines	06/12	09/12	4	Master International in Food Industry.



Nom	Pays visité	Dates		Nbre/j	Objet de la mission
		début	fin		
PALLET	Brésil/Chili	12/04	24/04	12	Participation séminaire formation professionnalisante à Botucatu; contacts avec partenaires du Cône Sud avant prise de fonction
PIOCH	Etats-Unis	09/05	18/05	9	Participation Congrès de l'AOC'S ; visite centre de recherche USDA à Peoria (bilan collaboration)
PIOCH	Indo/Mal/tha	14/02	27/02	13	Indonésie, Malaisie, Thaïlande : Prospection secteur public/privé mise en place collabo. avec AIT
PIOCH	Brésil	05/10	14/10	9	Participation au 2ème meeting partnership for technological and industrial development
PIOCH	Malaisie	05/12	20/12	15	Collaboration avec le PORIM ; collaboration avec l'AIT ; Stage d'Elodie Cazelle.
VAITILINGOM	Espagne	28/01	31/01	4	Colloque sur l'utilisation non alimentaire des oléagineux
VAITILINGOM	Pacifique	11/04	30/04	19	Fidji, Nlle Calédonie, Vanuatu : Projet huile de coco biocarburant
VAITILINGOM	Mali	22/03	06/04	15	Etude des solutions énergétiques pour les usages de puissance au Mali.
VAITILINGOM	Chine	23/11	01/12	8	Projet franco-chinois de coopération en technologie après-récolte des céréales
VALENTE	Pologne	23/05	30/05	7	Participation "3rd International Conference on Physics of Agro and Food Products" présentation d'une communication.
VILLENEUVE	Allemagne	05/11	05/11	1	Réunion concernant la fin du contrat Goldschmidt 3
WACK	Grèce	25/03	28/03	3	Participation au meeting de l'action concertée européenne sur la "chaîne du froid". Présent. de communications et conso du groupe sur les prétraitements
WACK	Italie	31/03	03/04	3	Participation à la réunion de l'Action Concertée de la Communauté Européenne sur les traitements osmotiques à Bertinoro - Italie.
WACK	Sénégal	20/04	28/04	8	Mise en oeuvre de la collaboration SNR3A/ITA - CIRAD dans le domaine agro-alimentaire.
WACK	Portugal	10/09	13/09	3	Participation au séminaire de l'action concertée européenne sur la chaîne du froid ; présentation communication
ZAKHIA	Colombie	01/01	13/02	43	Mission préparatoire à l'affectation en poste au CIAT, Cali, Colombie
ZAKHIA	Bolivie	26/10	30/10	5	Participation, présentation d'une communication au séminaire VI Jornada del Prodar Andino - I Seminario Nacional de Agroindustria Rural, Bolivia

## Répartition du nombre de jours de missions



### **Current state of the Quality Assurance Programme launched in 1998 for the pilot plant workshops and laboratories**

In 1998, we took a number of steps towards establishing a quality assurance system in the Agrifood Systems Programme laboratories and pilot plant workshops.

Priorities were defined in line with the work carried out by the Agronomy Programme. The requirements of the ISO9000 standards were used as a reference. We also worked in liaison with S. DEGRES, ASP scientist and director of ESIMAQ, who suggested a quality approach based on operational reliability.

#### **Resources employed**

The Programme Management appointed two quality assurance managers, G. PIOMBO (laboratories) and D. GOUNELLE (pilot plant workshops). They are assisted by technical operations officers (Appendix 1), who are responsible for the operation of the scientific equipment and the procurement of consumables and chemicals, for writing operational procedures, noting any cases of non-conformance ("incident forms") and undertaking the appropriate corrective measures.

#### **What was done in 1998**

The most important measures were programmed in accordance with simple rules of good laboratory practice: clearing, putting away, cleaning and organizing materials and equipment and establishing monitoring procedures.

**The laboratories were reorganized** on the basis of the scientific fields involved.

**The inventory and management of all equipment** in the pilot plant workshops and laboratories is currently being updated. The technical officers have been assigned the task of carrying out the equipment inventory. A fundamental element of the Quality Assurance Programme, the inventory of the mechanics workshop equipment, has been completed, together with "equipment files" for each machine.

The "equipment files" contain information on:

- equipment type, registration
- manufacturer and supplier (with contact details)
- date of purchase and date brought into service

A "history sheet" has been created for each machine, giving the maintenance and service history.

All information and files have been put on computer using the Sbmata equipment management software package (purchased for one workstation in 1998). This alerts us, among other things, to the future maintenance operations required. The same procedure has already been applied to Laboratory 119 and is in the process of being applied to all remaining laboratories.

A system for **informing staff and monitoring quality assurance measures** has been established by the monthly meetings of the Quality Committee. The reports have been circulated to all participants and to the heads of programme teams.

The technicians and the quality assurance managers have been assigned the task of **writing up the operational procedures** of the experiments they undertake. Twenty or so operational procedures are at present in the course of validation.

Management of the operational procedures and quality documents needs to be organized. **Quality documentation management** is the first general procedure for validation, it covers the principles of presentation, codification, circulation and archiving of quality assurance documents. The general "Quality Documentation" procedure has been written and is in the process of being approved.

#### **Management of "non-conformance" or "incident" sheets:**

"Non-conformance" or "incident" sheets are to be completed by all Programme staff.

The sheets are then processed to determine preventive or corrective measures aimed at preventing the appearance or reoccurrence of similar faults.

**Safety:** In parallel with the Quality Assurance Programme, it became apparent at meetings of the Quality Committee that there was a need to ensure that certain basic rules of safety are observed in the laboratories and pilot plant workshops. In particular, we have a duty to inform the numerous trainees hosted by the programme, and to this effect we propose a contractual leaflet signed by both the trainee and his or her supervisor. The leaflet, currently being finalized, will be approved by the CHSCT before its introduction.